strength to withstand the force of the elements and in many cases proper clearances have not been adhered to. As a result, troubles of various kinds have developed, some of which have been of a very serious nature, even to the extent of causing loss of life. Railway despatching and message lines as well as automatic block and other similar signal circuits have been interfered with because crossing wires have dropped, causing dangerous crosses bteween wires. Many cases could be cited to show how important it is for the railroads to insist that wire crossings should have ample strength.

It is not the intention to imply that great progress has not been made in the development of satisfactory wire crossings. The old rule of thumb methods have practically been abandoned for those based strictly on engineering principles. For instance, in 1913 at the annual convention of the Association of Railway Telegraph Superintendents, now the Telegraph and Telephone Division of the American Railroad Association, a specification covering the type of construction for signal line crossings over railways was accepted. This specification was the work of a joint committee on which the Bureau of Standards was represented, and was based largely on engineering principles. Later the American Railway Association adopted it and a large number of roads and wire owning companies accepted it as standard practice. Now the Bureau of Standards is prepared to issue a revised set of rules and regulations, which it believes are superior to its former code and it is quite certain the railroads will welcome the progress which has been made from the standpoint of safety alone.

However, the Telegraph and Telephone division, which held a special three-day session in Chicago on December 3 to 5 inclusive, feels that in some instances the revised code, insofar as signal line crossings are concerned, does not meet exactly with its views; particularly in the case of such wire crossings over spur tracks. For instance, the revised code states that a grade of construction, known as "grade E" and which is equivalent to two-thirds the strength of the type known as "grade D" used for crossings over main lines, shall be used for signal lines crossing over spurs not exceeding two tracks in the same span. It is a well-known fact that there are any number of such spurs, some of which are of considerable length, that are as important as main line tracks which require "grade D" construction.

The revised code also states that signal lines crossing over branch tracks, on which no regular schedule of operation is maintained, shall conform to "grade E" construction. There are also any number of branch lines that may be so classified; but they are considered just as important as main line track which requires "grade D" construction.

The matter of spur and branch tracks here mentioned, which are classed by some as minor tracks but which in reality are important tracks, should receive a great deal of consideration on the part of those who must pass upon the class or grade of construction to be adopted for signal line crossings. The most important factor involved and the one which should receive the greatest consideration, is the hazard to life. A very large part of the deaths and injuries of railroad employees engaged in transportation occur upon these so-called minor tracks. Because of the particular class of these tracks and because their use is for a certain service, employees are obliged to ride upon car sides, ladders and roofs much more frequently and under more hazardous circumstances than those engaged in work upon ordinary yard and main tracks. It would seem advisable, therefore, that extra care should be taken to avoid scant lateral and vertical clearances between electrical conductors, their supports and standard freight cars; and to provide ample strength in the conductors, their attachments and supports at crossings over such tracks.

The Only Way to Make Private Management a Success

THE REASONS WHY it is essential that the Government should provide a system of regulation which will enable the railway companies to raise sufficient new capital have been stated in various forms on many occasions, but they never were better and more concisely stated than by Judge C. A. Prouty, Director of Valuation of the Interstate Commerce Commission and also Director of Accounting of the Railroad Administration. Judge Prouty's summing up of the situation was made in the following words:

"The government might have built and operated its own railways, but instead of doing so it has invited private capital to discharge for it this public function, upon the assurance that such capital shall be allowed to exact a fair compensation for the service. Nothing can be more unjust than to deny to this capital that right.

"Not only does a sense of justice require this; self interest also dictates it. The railroads of this country must, in the immediate future, be very largely extended and improved; additional facilities must be provided to meet the increased demands which will be made. This will require the outlay of vast sums of capital; and this capital must come mainly, not from the earnings of the railroads, from the investing public. We can provide by legislation the sort of cars which a railroad shall use and the rates which it shall impose; we cannot by legislation force one single dollar of private capital into railroad investment against its will.

"Capital will seek investment in this field for exactly the same reason that it will in any other; namely, upon the expectation of making a profit out of the investment. It is not necessary that the return should be large; but it is necessary that it should be certain; that the people who put their money into this form of investment shall feel confident of fair and honest treatment.

"A want of adequate railway facilities would mean industrial paralysis. Unless they are provided when needed, the government will find itself confronted with a demand from all sources—from the merchant, the manufacturer, the farmer—which will force it to meet in some way the necessities of the occasion; and this can only be by either furnishing the capital or providing the railroad itself. If we are ever brought face to face with the proposition of government ownership, it will not be by the imposition of excessive charges, for we can deal with that situation, but by the impossibility of obtaining adequate facilities. The possibility of such an emergency is by no means fanciful. We were upon the brink of it in the fall of 1906, and the winter of 1907, when crops were rotting upon the ground because they could not be carried to market and when people were freezing because coal could not be transported to keep them warm.

"This phase of the matter is too little considered. If this government hopes to continue its present system; if we are to look in the future as in the past to private capital for the providing of our railroad transportation, it is fundamentally necessary that confidence in the fair treatment of that capital shall be established."

The reader who is familiar with existing conditions and with the legislative proposals pending in Congress might very naturaly assume that this statement of fundamental facts and principles was made by Judge Prouty with special reference to the situation which exists at the present time. On the contrary, the paragraphs quoted are from a lecture delivered by him before the senior class of the Sheffield Scientific School of Yale University in 1909, over ten years ago.

The railroad situation was very unsatisfactory at that time, but it was almost perfect compared with that which exists now. The shortage of facilities which existed then was complete adequacy compared with the inadequacy which exists at present. The ratio of total earnings to operating expenses was then small compared with what it is now. The net operating income in relation to the investment on which a

strength to withstand the force of the elements and in many cases proper clearances have not been adhered to. As a result, troubles of various kinds have developed, some of which have been of a very serious nature, even to the extent of causing loss of life. Railway despatching and message lines as well as automatic block and other similar signal circuits have been interfered with because crossing wires have dropped, causing dangerous crosses bteween wires. Many cases could be cited to show how important it is for the railroads to insist that wire crossings should have ample strength.

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return had to be paid was large compared with what it is now. The rate which had to be paid by the railroads for new capital was comparatively small and railroad credit relatively excellent compared with what they are now.

If it was desirable that the public and the Government should ten years ago heed the statement of principles which Judge Prouty then made and the implied warning which he then gave, how much more important it is that they should heed his warning and act on the principles ennunciated by him at the present time.

Do Not Abandon Any Good Methods

ONE OF THE DANGERS in the transition of the railways from federal to private control is that they may discard some beneficial practices which have been adopted during unified operation by the government, in the general desire of railway officers to free themselves from the numerous unsatisfactory measures which have come into vogue during the last two years. This danger arises primarily from the fact that many men have become so exasperated at the restrictions of one kind or another that have been imposed upon them that they are disposed to be hostile to every measure that has originated under federal control, good or bad. As a matter of fact, unified control has afforded an opportunity for the introduction of many measures long advocated by railway officers, but impossible of attainment under the former law-enforced competitive private operation. To destroy these measures now would only result in permanent loss to the road and in many instances to shippers.

A prominent example of a good measure now in imminent danger of being discarded is the new tie specifications. The Railroad Administration took over the purchase of ties early in 1918. Late in the same year standard specifications were put into effect and uniform inspection inaugurated. These specifications have now been in force on all roads under federal control for over a year, and are therefore generally known. While opposed in some quarters they have been approved by a large majority of the tie producers and railway men as well, yet at a meeting called by the American Railroad Association the Track Committee of the Engineering Section of that organization recommended that the specifications of the Railroad Administration be superseded by those of the American Railway Engineering Association.

The Tie Committee of the American Railroad Association also considered this matter at a two-day session the first week in December. The specifications of the Railroad Administration are not perfect; their most ardent advocate will admit that certain defects have been shown to exist. Yet the fact remains that they are in use today on almost the entire mileage of the country, and their requirements are known alike to producer and purchaser.

The hostility to them really does not arise from the specifications themselves, but from other measures of the Railroad Administration in buying ties under them. That the centralization of the purchase of ties has not proved satisfactory to the producer or railway men is well known; few activities have aroused greater hostility, yet most of the measures giving rise to the opposition by the producers originated prior to the preparation of the specifications. Indeed, much of the opposition which exists to the specifications themselves can be attributed to the hostile frame of mind engendered by these earlier acts.

The uniform specifications have much of good in them. The roads should not permit them to be discarded because of hostility to ill-advised measures. Every method which has been adopted under government control should be considered on its individual merits and should be accepted or rejected as such without reference to other measures.

Letters to the Editor

Automatic Stops and Signals

TO THE EDITOR:

The letter describing a certain train control system published in your issue of September 26 on page 620 contains the following statement: "That trains have been stopped (automatically) when the following dangerous conditions prevailed—open switches—block occupied by train—cars fouling the main track—broken rails (on three occasions)." Anyone well informed on automatic steps and railway signaling is well aware that just such results would be obtained by the use of any one of a number of train control systems.

While the writer is in favor of automatic stops and feels sure that their use will prevent a number of a certain class of accidents, is it not a fact that the automatic stop is but an adjunct to the present signal system and its real or primary function is to enforce obedience to proper signal indications as controlled by standard track circuits?

Technical railroad men and other railroad officers who are familiar with the operation of automatic signals clearly understand that properly placed signals would have given stop indications for the above mentioned conditions and that the function of the automatic stop is to correct the engine man should he for any reason be unable to see or fail to obey such signal indications. A. T. C.

Supervision Versus Efficiency

TO THE EDITOR:

I note in the article on page 675 on "The Shop Craft Agreement" in your delayed issue of October 3, that you state "One great weakness of American railroads is the lack of adequate supervision."

I could more readily agree with this statement had the word "adequate" read "efficient," as I believe there are few of the larger roads which have not already an adequate corps of supervisors—in fact most of the local officers on those lines will, I think, readily concede that there generally is a superfluity in the number of supervising officers. In my opinion if the present officers could be required to exercise the efficiency for which they are paid, less rather than more supervision would better meet the needs.

I travel almost constantly on the railroad which employs me and I am assigned to do general efficiency work—to be the eyes, so to speak, of the chief operating officer and to remedy locally, when practicable, anything I observe which is not efficient or up to standard. In this capacity I am constantly finding items which the local and other officers concerned should and would discover themsevles were they doing their work with the efficiency that should naturally be expected of them. The laxness of supervision on railroads generally is inexcusably appalling. A man who draws a salary for supervising and fails to do so is, in a sense, obtaining money under false pretenses; if his failure is due to his ignorance he has no right to be a supervisor—and in either event should be removed.

One superintendent said to me not long ago that most of his time was taken up with the various specializers sent out from the general office—each having a list of items pertaining to their department which were not up to standard on his division. I asked him whether he and his subordinate officers concerned were familiar with the standard require-

ments and if so why they did not see they were observed and thereby make these specializers useless. He said these men look only for the things upon which they are specializing and having trained their minds on those particular features could see what the others could not. I know from my own experience this is a gross exaggeration and a mere excuse to cover inefficiency. Their superior officers, having as a rule risen through their superintendent's experience, take much the same viewpoint, and in consequence this lack of efficiency not only is allowed to exist but, being unchecked, is growing with impunity.

As the attitude of the chiefs is reflected all the way down to the ranks, the tendency of officers and foremen is to become complacent, self-satisfied individuals, imperturbed appendages and expensive adjuncts. An Observer.

Inadequate Compensation for Supervision

To the Editor:

The writer was very much interested in an editorial printed in one of the recent delayed copies of the *Age*. It referred to the compensation of railroad supervision.

By way of illustration, I should like to cite the predicament of the shop superintendent on a certain trunk line railroad:

We have about 500 employes, doing a general line of repair work consisting of about everything from wheel-barrows to business cars. Our output monthly consists of about 900 classified, repaired freight cars and an average of about 40 passenger cars. We also do a considerable amount of work for the maintenance of way department, and manufacture forgings, etc., for other smaller shops along the line.

The monthly compensation for the shop superintendent will average a little less than that earned by members of the wreck crew. Is it possible, under this arrangement of compensation, that the management can expect one to put forth his best efforts, especially with the order in effect that supervision may not be engaged by another road under federal control without first getting permission from the Railroad Administration?

Shop Superintendent.

The Train Despatcher and His Opportunities

Council Bluffs, Iowa.

To the Editor:

The probable near approach of normal life in the railroad world—superseding petrified existence as governed from Washington—prompts me to put in a word once more in behalf of the despatcher.

At first thought one might draw the conclusion that a despatcher fills a secluded position; but as a matter of fact the position has to do with one of the broadest fields of railroad work, and it depends on the individuality of the despatcher himself as to what benefit he shall derive from the opportunities offered by his position.

Being assigned to regular hours with a certain routine, he may easily allow himself to do his work in a mechanical way. Too many despatchers labor under the impression that their only duty consists of making provision for the meeting and passing of trains, leaving the other details to the chief despatcher; but the more attention given by the despatcher to the smaller details the better will be his efficiency, and only by efficiency can he prepare himself for more responsible positions.

The despatcher on duty has a better knowledge of general conditions than any other person on the division. He is in position to furnish first-hand information that even the superintendent could not furnish. To display the proper spirit and care in giving information to all concerned, from superintendent to section foreman, is one of the chief opportunities of a train despatcher to gain favor with these men. This is a plain duty to himself.

His duty to familiarize himself with the physical characteristics of his territory offers him a grand opportunity. He should know not only the location of tracks, switches, grades and bridges, but also the location of the principal industries and the things that they require. He can become personally acquainted with the owners of the different industries, thereby broadening and cultivating his own personality. By personal contact with these men he is better qualified to serve his company in its intercourse with them. Some may claim that these are matters to be handled by the superintendent and train masters. True, but the despatcher can do these things in an unobtrusive manner, keeping in mind that he is only a despatcher.

Again, the despatcher should make it a point to become personally acquainted with the yardmasters and assistants at the terminals. Everyone knows that better results are obtained by personal interviews than through any other medium. Such acquaintance will often change the tone of all subsequent correspondence.

In his frequent trips over the road the despatcher should do his very best to become better acquainted with the train and enginemen; learn their dispositions, character and manner of doing their work. Get on the engine and have the enginemen show you the different parts of the machinery; then when an engine failure occurs you have a nearer conception of the trouble. When failures occur which the despatcher does not understand let him keep it in mind and at the first opportunity have some engineman explain it. Enginemen will be glad to do this.

When the trainmen learn that the despatcher possesses clear knowledge of how things are being conducted on the road they have greater confidence in him. Compliment the man on the road as often as possible for good work performed.

The foregoing may be what the newspaper man calls "tame stuff," but commonplaces make up the most of life. The despatcher can increase his efficiency, make his position more secure and live happier by making use of diplomacy and tact and not following a beaten path. We all aspire to better positions. Let us study some of the requirements that are felt by the man higher up. The despatcher, in the discharge of his duty, often has to assume the authority of officers, from the rank of superintendent down. Why, therefore, should he not inject some of their ingenuity into his work?

We cannot succeed by theory alone, but must carry theory into practical execution. Let us try it.

Keep wide awake all the time! Don't let any eight-hour limitation dwarf your interest in your employer's prosperity. Keep your mind on good railroading sixteen hours a day. Is this too much? Well, try it for three days in the week and see how it works. H. S. M.

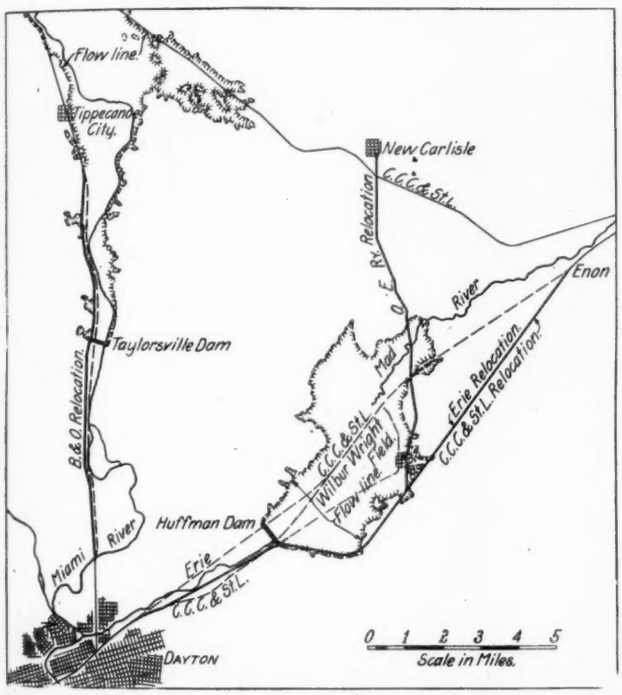
Every westbound train is filled with passengers who admit that they are emigrating to a warmer climate to avoid the inconveniences of cold weather and little coal. It has been a common remark among passenger traffic officers on western roads leading to southern California and other regions of balmy atmosphere, during the past few weeks. Sleeping car berths have been engaged many days in advance, and for weeks every transcontinental train had to have a second section. The traffic originates in the east and north partly, but they say that Iowa and Nebraska have been furnishing more California tourists than any other section.

The Miami Conservancy Relocates Four Railways

Fifty-five Miles of New Track Constructed to Replace Lines Lying Within Flood Basin

IT IS NOT often that a railroad is built by the public for a public utility corporation, but this is what actually is taking place near Dayton, Ohio, where the Miami Conservancy District is now completing about 55 miles of track or 40 miles of roadbed at its own expense for the Cleveland, Cincinnati, Chicago & St. Louis, the Erie, the Baltimore & Ohio, and the Ohio Electric. The work is under the joint supervision of engineers representing the Conservancy project and the railroads, the former covering matters contingent upon the District's interest in the cost and the latter with respect to the completion of the work to standards acceptable to the railroads.

This work is a necessary detail of the flood prevention project undertaken by the Miami Conservancy District in the valleys of the Miami and Mad rivers above Dayton. A



Map Showing How the Two Retardation Basins Interfered with the Railroads

great dam is being built at Taylorsville, on the Miami river, and another at Huffman, on the Mad river, to hold back flood waters in great retarding basins behind these dams. Discharge spillways are provided which will release the water in quantities readily handled by the river channels through the lower valleys where much damage was done by the flood of 1913. All land located within the flood limits of the reservoir is, of course, subject to potential inundation, and for this reason has been vacated through purchase by the District. Included in the property thus condemned are the lines of the four railroads mentioned, which must be relocated outside of the flood limits. This work has involved not only the reconstruction of new lines to replace those stretches of track lying within the reservoir areas, but also entails considerable mileages both up and down stream which were required to secure satisfactory approach grades to the higher elevation of the lines to avoid high water.

The expense of the relocations is borne entirely by the Conservancy district and will amount to about $4,000,000, although the railroads, like all other owners of property within the Conservancy district, are assessed "benefits" for the advantages assumed to accrue through decrease of flood hazards. Agreements with the railroads also cover adjustments for the relative values of the new and old lines, from

Steam Shovel at Work in the Huffman Cut

an operating standpoint. Thus, while ruling grades were not changed, it was impossible to provide new lines which were not either longer or shorter than the old ones or which did not contain either a greater or a less amount of curvature. For instance, in the case of the relocation of the Big Four and the Erie, the railroads are entitled to $400,000 extra compensation for 4,000 ft. of increased length and 100 deg. additional curvature. In the case of the Baltimore & Ohio line the case is the reverse, and the railroad will compensate the District for providing a better line than

Double Levees to Protect the Railways

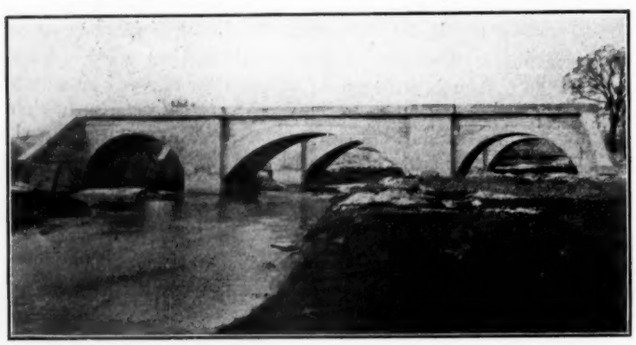
its old one. Recognition has also been given to the increased cost of maintenance in the early years of operating a newly constructed line, and allowance is made to the roads covering such cost during the first six years of use.

The lines affected are the Cincinnati, Hamilton & Dayton line of the Baltimore & Ohio north of Dayton in the valley of the Miami river, and the Cincinnati line of the Erie, the Cleveland-Cincinnati line of the Big Four between

Dayton and Springfield and the Ohio Electric, which occupy the flood plain of the Mad river.

As seen on the map, the old Erie and Big Four lines were located side by side most of the distance from Springfield to Dayton in a location close to the Mad river. Near the middle of the Wilbur Wright Field the two lines separated, the Erie occupying the north side and the Big Four the south side of the stream until a point close to Dayton, where the Erie again joined the Big Four on the south side. The relocation of these roads commences about two miles east of Dayton and extends for a distance of 15.2 miles. These two roads have been operating their single-track lines as joint double track for a number of years and will continue to do so after the relocation has been completed. The old lines of the Ohio Electric lay parallel to the Big Four for a distance of about five miles out of Dayton, and occupied an independent location for the remaining distance.

The critical point in the relocation project is the dam site at Huffman, where the required position of the great dam and spillway made it necessary to place the new lines about 400 ft. south of the existing track of the Big Four. This involved two difficulties, the presence of a massive shoulder of rock rising abruptly from the south abutment of the dam and the requirement of a 0.3 per cent approach grade for the railroads from the west. Because of definite restrictions on the location of the foot of this grade within the city of Dayton it was possible to raise the line at the dam site only about 31 ft. above the old grade line and 10 ft. below the crest elevation of the dam, with the result that a rock cut 4800 ft. long and 119 ft. deep (on the upper side) was required. This entailed the excavation of 683,000 cu. yd. of material, most of which was rock. Because of this restriction on the elevation of the grade line a further com-

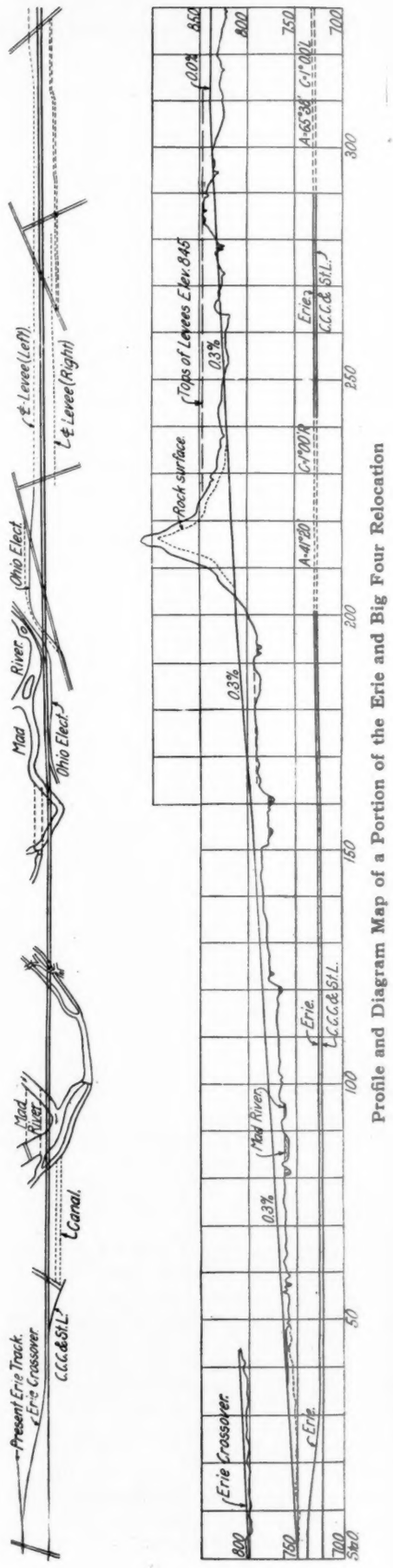


Twin Three-Arch Bridges for the Big Four and the Erie

plication was encountered at the east end of the cut where the line enters the south fringe of the flood area at an elevation below the maximum flood level. As a consequence, it was necessary to protect the tracks on both sides for a distance of 3500 ft. by the construction of levees to a maximum height of 35 ft. These were located 200 ft. center to center and have the effect of placing the line in an artificial cut.

For drainage of the highlands to the south of the track, culverts were built under the tracks and levees which will serve also to equalize water levels on both sides of the levees during flood periods. These levees are continued to a point where the 0.3 per cent grade ascending eastward raises the line above the flood water level. For the remaining distance the location was determined by requirements of suitable connections with the existing lines. This was accomplished with the use of an 8-mile tangent.

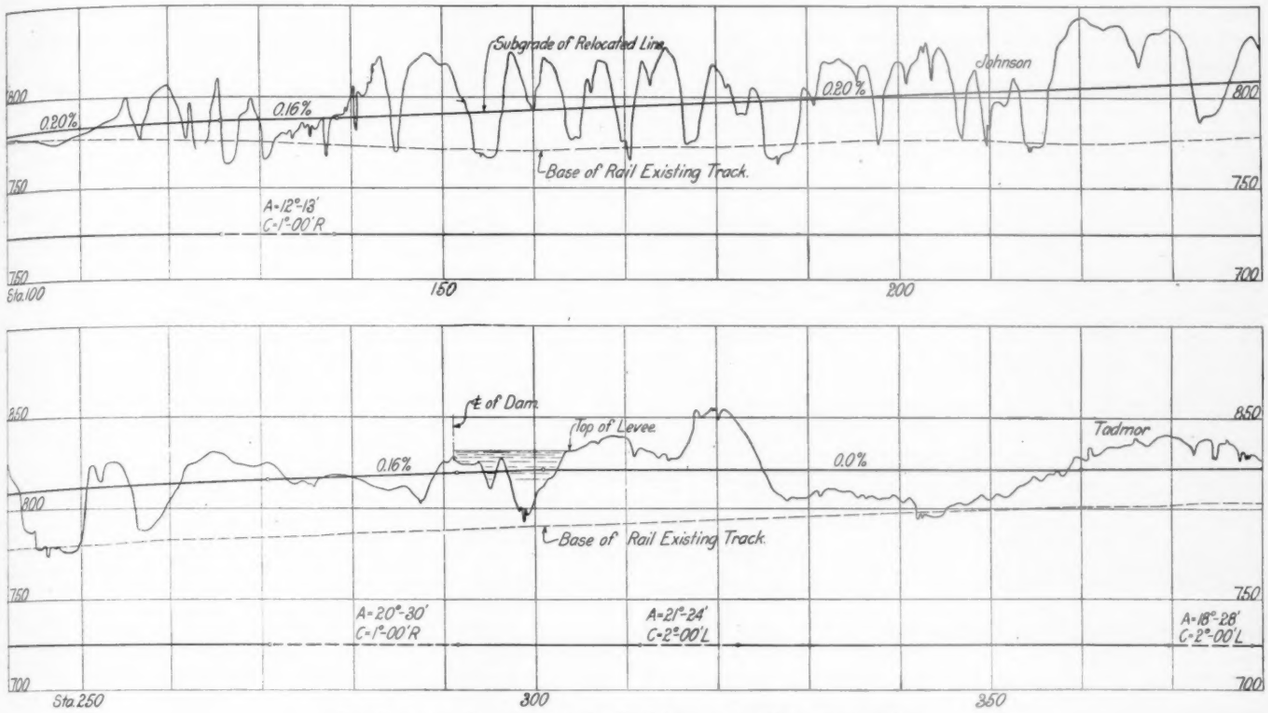
No change was required in the location of the Ohio Electric between Dayton and a point a short distance west of the Huffman cut. After passing underneath the new embankment of the Erie and the Big Four through a skew under-



Profile and Diagram Map of a Portion of the Erie and Big Four Relocation

crossing accommodating both the electric line and the Springfield pike, both the electric road and the highway occupy a shelf in the face of the hill outside of the big railroad cut, while to the east of this the Ohio Electric will be placed in the top of the inner levee protecting the railroad tracks.

The west approach of the railroad relocation is on a tangent approximately midway between the two old locations of the Big Four and the Erie, throwing a considerable portion of it into the Mad river flats. This entailed an extensive channel change of the river, which was excavated by a

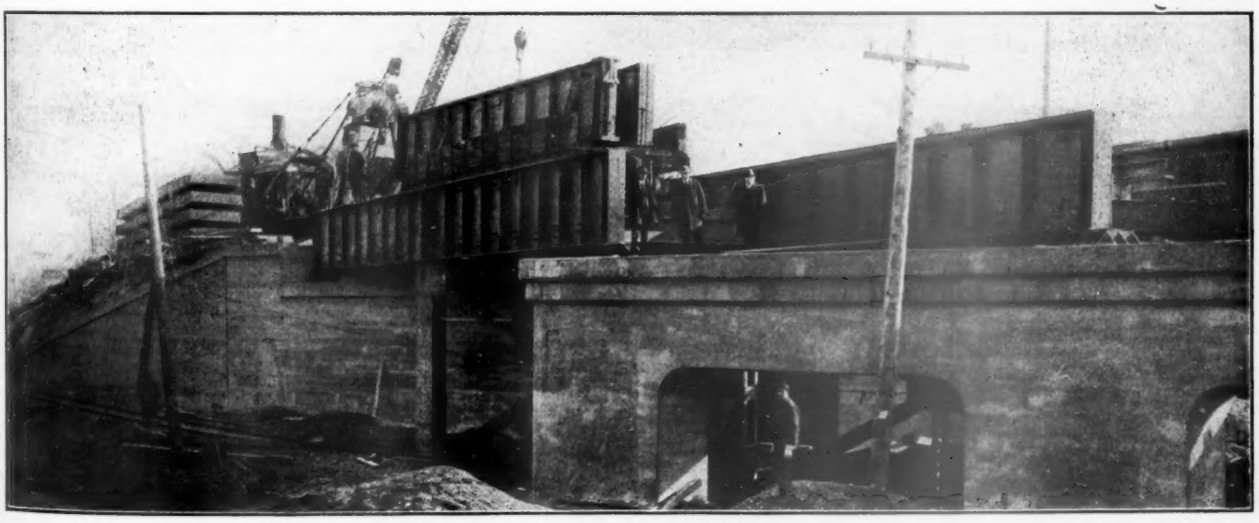


Profile of a Portion of the Baltimore & Ohio Relocation

The tracks of the Erie and the Big Four occupy a single roadbed at 14-ft. centers from the junction point near the city limits of Dayton to the eastern end of the levees, where they spread to 60-ft. centers and occupy separate roadbeds for the remaining distance to the end of the relocation. Single track roadbeds are 20 to 30 ft. wide and double track 34 to 44 ft., with slopes of 1½ to 1 for earth and 1 to 1 for rock. The maximum rate of curvature is 1 deg. and the 0.3 per cent grade is compensated 0.04 per cent on curves. The width of roadbed in the big cut is 70.5 ft.

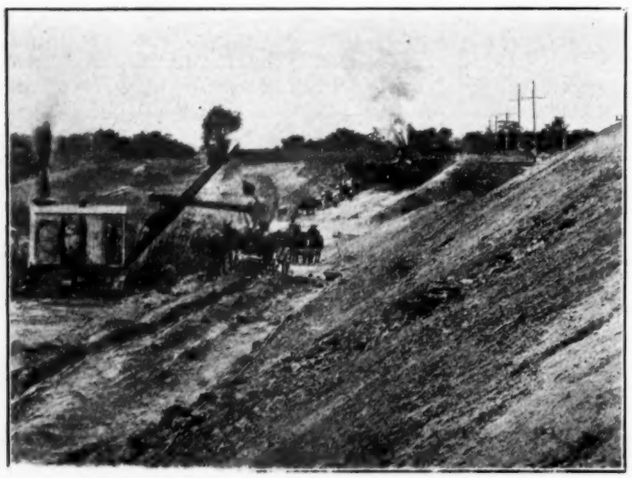
clam shell bucket operated by a portable derrick. The approach is entirely on embankment involving 374,000 cu. yd of filling, which was made largely from material taken from Huffman cut and excavation for the outlet of the conduits at the south end of the dam.

The Huffman cut was by far the most formidable portion of the railway work and controlled the date on which it could be completed. The work was done by the forces of the Walsh Construction Company, Davenport, Iowa, the general contractor for the entire railroad project on the Mad



Skew Undercrossing West of the Huffman Cut

river. The total volume of material removed is 683,000 cu. yd., of which about 80 per cent is rock, which extends to the surface in many places. The upper stratum of material is Brassfield limestone, under which is an Elkhorn shale, underlaid in turn by limestone and clay formations of the Cincinnatian period. This material had to be loosened by blasting, using 40 per cent gelatine in holes drilled both with well drill and steam hammer outfits. These holes were placed from 12 to 18 ft. apart and from 6 to 16 ft. deep. They were usually sprung before shooting and then loaded



Grading with Revolving Shovels and Horse-Drawn Wagons

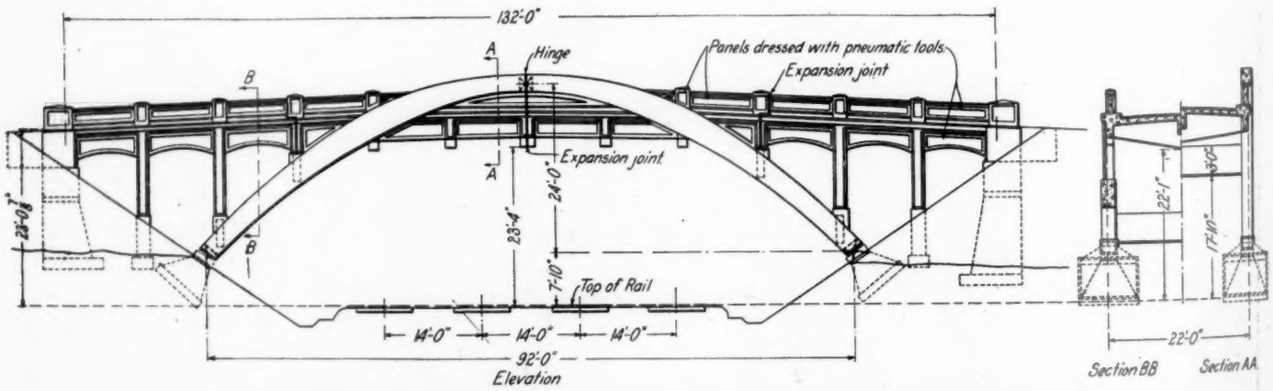
with 100 lb. of explosive and shot in groups of about 11 holes at a time. In moving the material from the cut after the excavation had progressed to a point where it was possible to eliminate switch backs in getting the dirt trains down onto the embankment, the loading track was made continuous through the cut, so that the trains could carry the spoil in either direction. This was done so that the material could be used in the levees to the east of the cut as well as in the long approach embankment to the west. The construction equipment consisted of a 70-C Bucyrus shovel and three standard-gage trains. This shovel handled as much as 4,000 cu. yd. of rock in a 10-hr. shift, with an average of about 36,000 to 38,000 cu. yd. of material per month.

East of the levees the heavier work consists of four cuts of 35,000, 85,000, 105,000 and 23,000 cu. yd., respectively, which were handled as sub-contracts by the George W. Condon Company of Omaha. The last cut was handled entirely by teams. In the others excavating graders and teams were used within the limits of economy, and then a steam shovel with three-foot gage cars and locomotives were installed to remove the remaining portion of the material for the construction of embankments at greater distances from the cuts.

The structures on this portion of the work included an underpass for the Ohio Electric and Springfield pike west of the Huffman cut in the form of a 4-span through girder structure on a 25-deg. skew, involving 320 tons of structural steel. Toward the east end of the project where the Big Four and the Erie occupy independent roadbeds, there is a pair of twin three-span arch bridges, shown in one of the photographs. Other structures include a considerable number of concrete culverts of various sizes. Some of these, which pass under the roadway, and two levees are over 300 ft. long. The masonry for the skew under-crossing mentioned above was built by the Walsh Construction Company, but all of the other structures were built by the Conservancy District with its own forces.

The Baltimore & Ohio Work

The Baltimore & Ohio location is of an entirely different nature than that in the Mad river basin. The old track of the railroad occupies a location close to the river and at a relatively small elevation above the normal water level, and continues at this low grade for such a distance upstream that the railroad does not reach an elevation above the flood level of the retarding basin until within the vicinity of Tippecanoe City, some four miles above the site of the Taylorsville dam. The sides of the Miami river valley, which is quite narrow, are much steeper than those of the Mad river, so the relocation of the railroad in this case consisted essentially in shifting it up the hillside for a maximum difference in elevation of about 32 ft. As in the case of the Mad river project, the matter of approach grade was of vital concern. The ruling gradient to be applied in the Baltimore & Ohio work is 0.2 per cent, compensated for curvature. To obtain the desired elevation at the dam with this limiting gradient it was necessary to carry back the foot of the approach nearly 6½ miles, or almost a mile south of the Miami river bridge, which is about a mile out of Dayton. The grade over this bridge was raised 6 ft. in connection with a reconstruction of the structure. North of the dam the new



Elevation of the Highway Arch Over the Baltimore & Ohio at Taylorsville

grade line is virtually level until it reaches the point where it intersects with the old line. To protect the roadbed at the dam, which has a crest about 14 ft. above base of rail level, levees are also being provided on each side of the track for short distances. While the old line was built for the most part on a low bench at the foot of the hillside, the new line, being elevated half way up the slope, traverses a succession of short cuts and fills, producing a very choppy ground line, as shown on the profile.

The line is built for double track, for which the railroad

pays the district the additional cost over single track at all points where the existing line has no second track in the form of a passing track or otherwise. No provision has been made for new passing tracks outside of the double-track roadbed.

The entire project on this road involved the excavation of 850,000 cu. yd. of material, nearly all of which is earth, and it is distributed among a large number of moderate sized cuts. The work was awarded as a general contract to Grant Smith of New York, but was handled directly by H. C. Kahl of Davenport, who sublet portions of the work to Kahl Brothers, the Vang Construction Company, and Condon & Smith. The work was handled according to a variety of methods. From stations 110 to 126 a sub-contractor used an excavating grader and teams. Between sta-

The Baltimore & Ohio Project Was Largely Side Hill Work. Old Line in the Foreground, New Line Above

tions 126 and 154 the material was removed with a 70-C Bucyrus shovel and loaded onto narrow-gage dump cars, while the distance between station 154 and Johnson two revolving Erie shovels were used with teams. North of Johnson two more 70-C shovels were used with narrow-gage cars.

By far the most important structure on this portion of the line is a 92-ft. reinforced concrete arch for a highway overcrossing at Taylorsville, and which connects with the highway on top of the dam. This is a two-ribbed, three-hinged structure of a combination of the open spandrel and suspended floor types. This form of design was selected to accommodate conditions under which the center line of the arch ribs at the crown could be 6 ft. higher than the crown of the roadway. As a result the deck of the structure is suspended from the ribs for a length of 44 ft. at the crown, while the outer portions over the haunches are carried above the ribs on a column-and-girder spandrel construction in connection to two additional spans carried on independent abutments and piers beyond the limits of the arch structure on either side. The ribs are reinforced with built-up structural steel frames, having bolted connections to the hinge castings.

Owing to the irregular nature of the ground line a great many waterway openings were required under the embankment, which were taken care of by concrete culverts and concrete culvert pipes. At four places provision for highway under-crossing and waterways was made by concrete arches varying from 12 to 30 ft. in span.

The railway project has been carried on under the direction of Arthur E. Morgan, chief engineer of the Miami Conservancy District, the railroad work being under the immediate direction of Albert Larsen, division engineer for the District. The interests of the Cleveland, Cincinnati, Chicago & St. Louis and of the Erie were represented by G. P. Smith, consulting engineer of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, while the interests of the Baltimore & Ohio on the Miami river project were represented by E. G. Lane, chief engineer, Baltimore & Ohio lines west at Cincinnati. The work was started in April, 1918, and is to be finished early in 1920.

Railroad Fuel Promptly Paid For

WALKER D. HINES, director general of railroads, on December 6, authorized the following:

"Statements having been given circulation to the effect that the Railroad Administration is delaying payments for coal in order to obtain a lower price, and that as a result mines now producing coal will have to be shut down within 17 hours, I feel that the public should be reassured and informed that there is not the slightest foundation for such statements.

"The coal now being produced falls into two classes, first, the coal actually used by railroads, and second, the coal which is diverted under the orders of the fuel administrator to essential consumers. The coal within the second class, under the plain terms of the fuel administrator's orders which are the same as those in effect during the war is to be paid for by the new consignee, and not by the railroads. Much of this coal is being shipped long distances, because practically no coal is now being produced in the West, and as a result, it takes some time to render bills to the new consignees.

"As to railroad fuel, instructions were issued by the Railroad Administration prior to the present agitation of this subject that it should be paid for promptly, and in addition special arrangements have been put into effect under which operators actually needing money to continue operations may be enabled to obtain money through the railroads. As an evidence that such instructions are being carried out, arrangements have been completed under which the Chesapeake & Ohio has obtained one million dollars from the Railroad Administration to pay operators on that road, and railroads in the Allegheny region have been instructed to pay for coal on a weekly basis.

"To assist further operators to obtain funds, the Federal Reserve Board was requested to rule, and has ruled that the note of a shipper of coal who has coal in the possession of a railroad to be transported, delivered or diverted, and who is to be paid by the consignee or divertee, is a note issued or drawn for a commercial or industrial purpose, within the meaning of Section 13, of the Federal Reserve Act, and is eligible for rediscount by federal reserve banks. The Railroad Administration has arranged that certificates shall be given by the agents of the Railroad Administration to a shipper on the loading of coal so that it may be established that a note is of that character and to make it desirable paper for rediscount, by federal reserve banks.

"The Railroad Administration is not delaying any payments on account of any dispute as to price. The only questions at issue as to price involve some wholesalers, as to whom the intent of one of the Fuel Administrator's orders has not been entirely clear, and as to some coal sold under contracts made prior to October 30 and shipped after November 13. Neither of these questions involve serious problems.

"The public should demand that the Railroad Administration will not permit any coal operator to close down because coal delivered to railroads for their own use has not been

paid for and, therefore, the statements mentioned are causing undue alarm.

"It should also be understood that these statements emanate from the same source which, soon after the present strike began, protested against the fixing of the government maximum prices on coal and regarding which the attorney general stated in a letter that your proposition amounts in effect to a declaration that coal dealers should be permitted to take advantage of these abnormal conditions, and have their prices based entirely upon the law of supply and demand, which is only another way of saying that they should be permitted to charge the public whatever they please."

In response to Senate Resolution 243 directing a report to the Senate of the arrangements that have been made or will be made for the prompt payment of coal diverted in transit from the original consignee, Director General Hines on December 6 sent to the Vice President a statement in part as follows:

"The Railroad Administration has been acting as the agency of the Fuel Administration in distributing coal to those users entitled thereto under the priorities described by the Fuel Administration and in performing this difficult work has been particularly solicitous to facilitate the promptest payment for coal by the users thereof to which the same might be diverted. Arrangements have been made to make sure that such users pay for the coal and pay for it promptly, and imperative instructions have been issued and reiterated that coal taken for railroad use should be promptly paid for. In addition, the Railroad Administration has cooperated with the Federal Reserve Board in adopting methods to facilitate the borrowing of money by the operators upon coal in transit. Further than this the Railroad Administration has requested the coal operators to give specific information as to any mines actually in difficulty on account of inability to collect their coal bills with sufficient promptness, and in the only instances which have accordingly been reported to the Railroad Administration it has made arrangements to purchase for railroad use enough coal and made immediate payment therefor to furnish the operators affected sufficient funds to meet their immediate needs.

"On November 3, 1919, the Central Coal Committee which the director general of railroads appointed at Washington to supervise the distribution of coal telegraphed all regional directors as follows:

The question which is being raised and which is deserving of immediate consideration is the prompt payment for coal confiscated by the railroads for fuel purposes. The point is made that mines which continue to operate will have difficulty in meeting their pay roll if payment for such coal is withheld for any considerable length of time.

The matter is, therefore, brought to your attention with suggestion that arrangements be made with all your roads for the promptest possible payment of coal that is confiscated for railroad use.

"On November 3 and 4 after representation by the National Coal Association and the Pocahontas Coal Operators' Association that coal operators were apprehensive about securing payment promptly for diverted coal, and in some instances that the operators might not receive such payment with sufficient promptness to enable them to meet their payrolls and other production expenses, the Central Coal Committee suggested that the operators in each district should interest themselves in this matter in their district, and arrange so that operators whose mines were working should be able to secure the needed financial assistance by borrowing money from banks against outstanding coal. It was suggested by the National Coal Association that payment for diverted coal would be facilitated if the railroad showed on the coal waybills the selling price of the coal when advised of this by the shippers, and on November 6, instructions were given all regional directors to see that this was done.

"On November 20, after being advised by the representative of the National Coal Association that apparently some operators did not know of the arrangement permitting the price of coal to be shown on coal waybills, instructions were therefore sent to regional directors by the Central Coal Committee to have agents advise shippers in writing of this arrangement. On November 26 instructions were sent to the regional directors that as far as practicable they should dispose of the oldest coal on hand first when making diversions or deliveries.

"On November 28 the Central Coal Committee, on being advised that some operators were claiming to be financially embarrassed, and this arrangement was desirable to assist them in securing their money, telegraphed the regional directors as follows:

To avoid financial embarrassment to shippers of diverted coal and consequent restriction of production, regional coal committees and federal managers should be instructed to insure prompt payment of bills by final consignees by making delivery of coal conditional on such payment if necessary. Arrangement should also be made that shippers are immediately advised of consignees to whom their coal is diverted. Every effort should also be made to pay for railway fuel with utmost promptness. This repeats previous instruction and is sent you to emphasize the importance of giving the subject special consideration.

"On being informed that banks in coal field districts were being drained of funds through loans to coal operators, conferences were held with representatives of the coal operators and later with the Federal Reserve Board to see what arrangements could be made to relieve the situation. As a result of this, the arrangements covered by the inclosed press notice of Dec. 3 were made and representatives of banks and operators agreed that this would be of material assistance.

"Again on December 3, telegraphic instructions were sent to all regional directors to put into effect at once the arrangements for issuing such form of receipt for coal shipments.

"Further on the same day the following telegraphic instructions were sent all regional directors:

See my telegram November 28 advising that prompt payment for diverted as well as contract coal was necessary to avoid financial embarrassment of shippers and consequent restriction of production. Also that every effort should be made to pay for railway fuel with utmost promptness. Our information is that operators are not receiving remittances promptly and instructions should be given by you to have all bills prepared, vouchered and paid immediately on receipt. This is of utmost importance.

"At various times since this matter was brought up, representatives of the coal operators have been requested to furnish information as to specific instances where there was a possibility the mines would be unable to obtain funds to meet payroll and other operating expenses, and no such specific instances were reported to the Central Coal Committee prior to December 4, when they were advised that two operators located on the line of the Chesapeake & Ohio Railroad were in such strained circumstances that a shut-down might possibly occur. Arrangements were made with the Chesapeake & Ohio Railroad to purchase for railroad use and pay for immediately sufficient coal now being produced by these operators to furnish them sufficient funds to meet their immediate needs. In addition to written and telegraphic instructions sent to regional directors, the question of prompt payment for railroad coal and prompt notice to shippers of diverting of commercial coal has been made the subject of frequent telephone conversations with interested railroad officers.

"The Central Coal Committee has arranged to secure daily reports of the number of cars of diverted coal and information as to whether or not shippers have been notified so that delinquencies can be corrected.

"As may be seen from the foregoing the Central Coal Committee and all representatives of the director general of railroads have appreciated the necessity and desirability of prompt payment for coal diverted and every effort has been made and will be made to secure such prompt payment."

The Future of Canada's Transportation Problem*

Development of Present Situation Should Show Relative Merits of Government and Private Ownership

THE PRESENT RAILROAD SITUATION in Canada and the events which brought it about have been discussed in previous articles. The question that naturally follows is, what will be the effect of this unique situation upon future railway history? The Dominion government is now operating approximately 13,200 miles or about 34 per cent of Canada's total mileage under the jurisdiction of the Canadian National Railways Company. In addition, the government is operating under the form of a receivership, with the Hon. J. D. Reid, Minister of Railways, as the receiver, the Grand Trunk Pacific which without doubt will become an integral part of the Canadian National system. The Dominion government, furthermore, is negotiating for the perpetual lease of the Grand Trunk and, because of its value to the Canadian National project, it is safe to assume that the Grand Trunk will also become a part of the Canadian National system. Assuming that the Canadian National Railways will ultimately include the Prince Edward Island, the Intercolonial, the National Transcontinental, the Canadian Northern, the Grand Trunk Pacific and the Grand Trunk, making a total mileage of 20,000 miles, what will be the effect of this merger?

We have, or will have in the near future, two great Canadian transcontinental systems, one owned and operated by the government, the other owned and operated by a private corporation. The parts comprising the former have been in more or less constant financial difficulty, whereas the latter has been financially successful, and has been earning a substantial return for its shareholders. The service given the public by the units of the former when compared with the service given by the latter is deficient. But it is only just now that the government lines are being welded into a single system.

What will happen to this system will depend on two things, the policy of the government and the education of the public. However, neither of these forces can produce an immediate effect. Regardless of whether this peculiar situation of a great government owned line in direct competition with a great privately owned line is desirable or not, it will certainly afford an opportunity to all students of railway affairs to view the relative merits of government ownership and operation and private ownership and operation.

Political Influences

Government ownership, it is often argued, cannot be divorced from politics. The Canadian National Railways typify government ownership. The logical conclusion, therefore, is that the Canadian National Railways cannot be divorced from politics. Certainly it is true that there has been political interference with government management in almost every democratic country where it has been tried. But the case of the Canadian National, the advocates of the nationalization program in Canada say, is different. It is true that House Bill 70, which incorporates the Canadian National Railways Company, has several clauses which are openly directed against political interference in the operation of the government system. The principal clauses of this nature are contained in Sections 14 and 15, which place the operation of the system under the control of the Board of Railway Commissioners which acts in a capacity similar to the Interstate Commerce Commission, and give the public the right to sue the Canadian National in any court of competent jurisdiction as well as the right of appeal to a higher court.

However, this does not necessarily mean that there will be no political interference in the affairs of the Canadian National. There are too many ways in which political interference can achieve its purpose aside from those against which certain clauses of the incorporating bill are directed for one to believe that the provisions of this bill entirely destroy the probability of this interference.

It is claimed that the executive and operating staff of the Canadian National Railways is now free from political influence. Apparently this is true. At the same time it must be remembered that there is not now a political party in power in Canada. The present government is a coalition Union government established by the Liberal and Conservative parties in order to remove politics from the conduct of the war. The present government is strongly intrenched, but it is essentially a product of the war, and there is a general feeling that the return to party lines should be made as soon after peace is signed as may be practicable. Both the Liberal and the Conservative parties have been seriously disorganized by the establishment of the present government and the result is a mixed situation which may bring a third party into existence. It is hardly probable that the same relations between the Dominion government and the Canadian National Railways will continue after this resumption of party activities.

Taking the two possible outcomes of the political situation in Canada, let us see what each will mean to the railway nationalization program. A return to the old party lines and the consequent fall of the present government, will probably mean a consideration of the advantages and disadvantages of the nationalization program. The result may be that the two parties will not agree upon its merits and that the question of nationalization will become a political issue. The fate of the natioalization program and consequently of the Canadian National Railways will then depend upon the party in power. In any consideration of the espousing of the nationalization program by either one of these two parties, it should be remembered that representation in the Canadian Parliament is based upon a membership of 65 from Quebec and the remainder proportionally according to population. This gives the growing west a heavy representation. If the policies of the old parties remain substantially the same as they were before the war, it is probable that the nationalization scheme will be supported by the Liberals, who practically control the west, and opposed by the Conservatives, whose strength is in the east. It is then that Parliamentary representation will count.

On the other hand, if the Union government is perpetuated much will depend upon the attitude taken toward the question by Prime Minister Borden, whose opinion as yet has not been publicly announced. It is significant that statements have been made by men prominently associated with the government advocating an extensive nationalization program. In this connection the Minister of Finance in addressing Parliament on May 15, 1916, said: "I believe relief (from the present situation) will probably involve the taking over by this government of one or more of the existing railway systems and may involve later on the nationalization of all the railway systems of Canada."

Railway nationalization to the extent to which it has progressed in Canada is due to the acts of the present Union government and it is but natural to suppose that if this

*Third and last of a series of articles on the railway problem of the Dominion of Canada. The first of this series appeared in the *Railway Age* of November 7, and the second in the issue of November 14.

government becomes the nucleus of a party, it will not reverse its previous acts.

All of the assumptions just made indicate that the question of nationalization will be one for political consideration in the future. This seems to be inevitable. The railroad financial transactions in which the government will have to engage make it inevitable that nationalization shall come in for a large amount of parliamentary and political discussion, and it appears certain that there will be clear cut differences of opinion. Here a point made by A. H. Smith, a member of the Commission of Inquiry appointed by the government in 1916 to investigate the conditions of Canada's transportation system and to present a solution of the problem, naturally is recalled. Mr. Smith, in dissenting from the report made by Sir H. L. Drayton and W. M. Acworth, based his dissent partly upon the impossibility of one Parliament binding succeeding Parliaments to a permanent policy in regard to railways. With all the conditions in mind it is impossible to believe that the Canadian National Railways will always be free from political interference.

The only real question which arises in this connection is the probable extent of the political interference. Those who are opposed to the natioalization program maintain that this interference will inevitably be extensive and cite the experiences of Canada with her government-owned roads during the past 50 years. On the other hand, those who favor the nationalization program claim that the past incidents in Canada's railway history do not necessarily indicate what government management will be in future.

Education of the Public

One of the most surprising features of the present situation in Canada is the apparent apathy of the public regarding the steps so far taken by the government along the road of nationalization and its tendency to travel further in the same direction. Even the passage of House Bill 70, incorporating the Canadian National Railways Company and granting almost unlimited power to that organization, besides making adequate provisions for the complete nationalization of all Canada's railways, caused comparatively little comment. This doubtless is due to the serious financial difficulties into which some of the railways had fallen. The seeming inevitableness of the action so far taken has dulled the sense of Canadians to the dangers ahead. Whatever the cause, the public has been apathetic regarding this tendency and only recently has begun to be awakened. But the fact that Canadians are now beginning to awaken means that they will be in a receptive mood to be educated as to the advantages and disadvantages of a policy to which they have already subscribed in part.

The public may be educated as the public of the United States has been educated regarding certain railway policies. The nationalization program will be a matter of political discussion; it may resolve itself into a clear cut national issue. Both sides of the case will then be adequately presented to the people as they have been in the United States and it will not be long before Canadian newspapers and periodicals will be as replete with arguments pro and con as are the newspapers and periodicals of the United States. This is not a matter of today but rather of the future, and by that time there will be brought home to every Canadian who pays taxes or who has occasion to use the railroads in any manner pleasant or unpleasant experiences with government or privately owned lines and he will have formed definite preliminary conclusions as to the respective merits of the two systems. It is in the future, then, that the public will begin asking what this nationalization policy has cost and whether the services rendered and the results achieved by government management are or are not in the public interest.

In contra-distinction to this assumption it is stated by advocates of the nationalization program that the people of Canada do not care particularly about the railway problem, for the cost to the government of nationalized railroads does not directly affect the masses. In support of this argument it is cited that there are but two taxes in Canada, income and municipal, and that these taxes do not affect the majority of the people. If enormous deficits are incurred in the operation of the Canadian National Railways, the public will have to pay them, directly or indirectly, and the cost will appear in taxes in such a manner that every person in the Dominion of Canada will definitely feel the extra burden.

The Canadian national debt, as a result of the war, is now estimated at $1,950,000,000, or $220 per capita. The burden of this enormous debt will call for rigid economy for years to come. With this debt and with probable reductions in the government revenues, it is rather hard to see how large deficits incurred in the operation of nationalized railways will fail seriously to affect every Canadian.

Influence on Development Work

Another of the arguments for government ownership and operation of railways is that as a result of it extensive work for the development of the country's resources will be carried on. Yet in Canada itself is an example of the development work which can be carried on by a privately owned and operated line, for there are few who deny the Canadian Pacific credit for the opening up of the Canadian northwest, and it would be difficult to point out any railway which has done less effective development work than has the Intercolonial under government management.

The Canadian Pacific has spent for development purposes $45,000,000 on 34,000,000 acres, or $1.34 an acre, while the Dominion government has spent roughly $10,000,000 on 84,000,000 acres or $0.13 an acre. Surely these figures tell a story of the power of privately-owned railroads to carry on such work.

The development of new territories depends upon capital, not government capital, but primarily private capital, for it is private initiative based upon the investment of private capital that makes for success in new fields. With government ownership of railways in the undeveloped territories of Canada it seems probable that there will not be the same amount of enterprise and capital invested as would be the case were the territory served by privately owned and operated lines. With the bringing of the nationalization question to the light of political discussion and appraisal, the people of Canada will begin to measure the quality and quantity of the development work which has been done or will be done by the Canadian National Railways as compared with the results achieved by the privately owned and operated Canadian Pacific. Fortunately there will be no duplication of lines by the two systems, for authorization for new construction will be based solely upon the relative merits of the claims for such work presented to the Railway board instead of to the Minister of Railways as has been the practice in the past.

Service to Be Rendered the Public

There is another factor that will enter into the education of the public which will have even more effect than the cost of government ownership or the extent of development work; that is, the relative quality of the service rendered the public by the government-owned transcontinental and the privately owned transcontinental. The service renderd to the public will be a definite matter regarding which a great many Canadians will form their own opinion. On the Canadian Pacific an efficient and loyal operating and executive staff has been developed and one has but to travel over a portion of its lines to appreciate the excellence of the passenger service rendered. In regard to freight service the Canadian Pacific has gone even farther to provide assistance to every industry and person that has occasion to deal with it. It is with this service

that the Canadian National Railways will have to compete. Under government ownership there almost always has been a notable lack of interest and initiative on the part of employees. The indifference of all classes of government employees is proverbial. The Canadian National employee is a government employee, and it remains to be seen whether he will or will not use the traditional "government stroke."

Service to the public is dependent largely upon the physical condition of the railway rendering it. The units comprising the Canadian National Railways have been in serious financial difficulties for many years. Such a state of affairs is hardly likely to be conducive to the maintenance of a property to high standards. In viewing the physical conditions of these separate units at the time of their amalgamation into one system, one can gain a rough idea of the present physical status of the government-owned transcontinental line. Beginning in the east and following this chain of roads across the country one will find that the Intercolonial might be said to be in mediocre condition. Its maintenance expenditures have not equalled those of the Canadian Pacific which traverses in part the same territory. Compared, then, with the physical condition of the Canadian Pacific in the east the Intercolonial cannot be said to be its equal, although in recent years there has been a serious effort to better the physical condition of the Intercolonial.

Moving westward, one will find that the National Transcontinental, being of recent construction, may be said to be in fair condition. This fact, however, is due to the newness of the road rather than to an effort toward maintaining it to certain standards. Being a new road it will take large expenditures to place it in shape to compete with corresponding portions of the Canadian Pacific. Furthermore, the National Transcontinental is badly lacking in equipment, although this is a condition which will be remedied to a certain extent by its inclusion in the government-owned system. The physical condition of the Canadian Northern is bad. A large proportion of the mileage was built to low standards, due primarily to the policy adopted by Messrs. MacKenzie and Mann to construct lines on these low standards and later as the traffic and consequent revenues increased to gradually improve them. Coupled with this is the fact that the equipment is poor and insufficient although this, as with the National Transcontinental, will be compensated for to a certain extent by its inclusion in the government-owned system. In the arbitration to determine the price to be paid by the government for the Mackenzie-Mann holdings an estimate of $110,000,000 was made by officers of that road as being necessary to place it in good condition. The cost of materials and labor since that time has risen and it is probable at the present time that $150,000,000 would have to be expended on the Canadian Northern alone to put it on a sound operating basis.

In regard to the Grand Trunk, its physical condition in 1916 at the time of the Drayton-Acworth report was such that an officer of the company in testifying as to its condition stated that "If we had $25,000,000 now it would put us in fine shape." Howard G. Kelley, president of the Grand Trunk Railway Company, in testifying before the commission of Inquiry at the same time, estimated that deferred expenditures on the Grand Trunk totaled $21,181,345, of which $8,943,971 was chargeable to the rebuilding and reinforcing of freight car equipment and $11,761,598 to deferred renewals in the maintenance of way department. Since that time these conditions have not been greatly improved and because of the higher costs of material and labor these estimates will have to be augmented greatly.

The Grand Trunk Pacific, like the National Transcontinental, being practically a new road may also be said to be in only fair shape and will require more than the ordinary capital expenditures to maintain it to the normal standard of efficiency. On the other hand, the lines of the Canadian Pacific paralleling these units of the Canadian National Railways have been maintained at an exceptionally high standard and because of these efforts in the past the road can be maintained at the same standard of efficiency at a cost far less than is the case with the Canadian National.

It is possible, then, to deduce from these rough estimates of the physical condition of the roads comprising the Canadian National Railways that in comparing the service likely to be rendered by the two systems, the Canadian National is not in a position at the present time to compete successfully with the Canadian Pacific on the basis of the relative condition of the two lines. In fact, enormous expenditures will have to be made by the government in order to place its lines in a position to compete effectively with the Canadian Pacific.

Of the other factors influencing the matter of service to the public, it might be said for the Canadian National Railways that by this consolidation the mileage between certain points in Canada will be reduced. Furthermore, the Canadian National will have certain advantages in grades, especially from Toronto, Montreal and Quebec to Winnipeg and Vancouver. However, it is rather hard to determine the advantage which this superiority in mileage and grades over the Canadian Pacific will give to the Canadian National system.

Attitude of Labor

There is still another factor to be considered in relation to the eduation of the public, namely, the attitude assumed by labor. As yet Canadian labor organizations have taken no definite stand in regard to this nationalization program. However, with the wage increases awarded railway workers it is probable that the same condition will prevail as now prevails in the United States, namely, that labor, because of these wage increases, will be reluctant to countenance any deviation from the application of the nationalization program. This, however, is merely a surmise and it is also possible that labor in Canada after hearing the nationalization program discussed as a political issue, will realize its defects as well as its advantages.

Relation of Situation to Canadian Pacific

We have outlined so far in this article the factors which will to the largest extent influence future railway developments in Canada. The consideration which remains is what effect all these conditions will have on the remaining privately owned line, the Canadian Pacific? To some the situation, however it may develop, means eventual confiscation of one of the most successful railway operations in the world. This assumption is based on several considerations, the principal one of which is the expressed attitude of the people of Canada toward the right of railways to earn interest on the capital invested in them and the fact that rates on a government transcontinental line can legally be reduced without limit. Throughout the history of the Intercolonial one can find members of Parliament and publicists stating, in defense of the continued deficits incurred on this road, that a government-owned railway, merely because of its ownership, should not be operated with a view to realizing interest on the capital invested. This belief has extended throughout Canada, and it may at any time cause a demand that the Canadian National Railways, being owned by the government, be operated in such a manner as to realize only their operating expenses, leaving the interest on the capital invested to be assumed by the taxpayer. Certainly the Canadian National Railways as a government enterprise have a certain right to reduce their rates ostensibly for the benefit of the people. If this is done to any considerable extent the Canadian Pacific will be forced into the hands of the government.

However easy it may be to put into effect radical reductions in rates it will be found that there are many factors which mitigate against such action on the part of the Canadian National Railways. The action taken in bringing the Canadian Northern and other roads under the jurisdiction of the

Canadian National and amalgamating these roads into one system was taken because of the desire on the part of the government to end a steadily increasing drain upon the public treasury. It can be seen that to cut rates would only serve to increase this drain. Again it must be recalled that Canada's national debt has greatly increased as a result of the war, and that the burden of this increased debt must be borne by taxpayers for many years to come. With these factors in mind it is hard to conceive how the Canadian National can afford to reduce its rates materially even for the purpose of development.

Another viewpoint taken by those who are studying the present situation is the direct opposite of this belief in the eventual confiscation of the Canadian Pacific. They think it is the purpose and intent of the government to avoid any action which will tend to force the Canadian Pacific into the nationalization scheme. It is their belief that the government, in adopting this policy, is doing so with a view of awakening and maintaining keen competition between the two transcontinental lines and in this manner nullifying some of the bad features of government ownership, especially indifference and lack of initiatives on the part of employees.

Sir Thomas White, the Minister of Finance, in reporting the last year's budget to the House of Commons, said, "Insofar as railroad rates and such are concerned, the railway rates in Canada, although recently raised, are certainly not more than sufficient to make a carrying return on the value of the properties used for transportation. Indeed, having regard to railway investments, railway returns, owing to the very great increases in the cost of operation, may well be described as low. In view of this it is impossible to expect a reduction in railway rates to be ordered by the Railway Commission. As a rate making proposition reductions at the present time are impossible."

If we are to accept the optimistic views of this latter class of railway students the situation will resolve itself into the development of the Canadian National Railways as a business enterprise rather than as a political project and the natural development of the Canadian Pacific.

Opportunity Afforded by This Situation

There has been outlined in this series of articles the present situation, the development which led up to this situation and the probable effect upon Canada's future railway history. Whatever the solution of this present and future problem may be, whether it be complete nationalization of all of Canada's railways or a reversion to private ownership, one thing is certain, and that is, that for a period of years, students of railway history will have in Canada an opportunity of noting a direct comparison of the respective results of government operation and private operation.

The Canadian National Railways will, whatever the future brings, run in direct competition with the Canadian Pacific long enough at least for conclusions to be drawn as to the merits of the two methods of conducting transportation. There is no doubt that advocates of government operation and private operation alike will look towards Canada for an answer to the problem, and this answer Canada will be prepared to give before many years have passed. Even at the present time the Canadian Pacific has accepted this challenge to private management and is bending all energies toward improving its service, awakening its employees to their new responsibilities and instilling in the minds of the public the excellence of the service rendered on its lines. Indicative of this movement is the establishment of the Trans-Canada Limited with 92-hour service between coasts.

Should government operation, as compared with private operation, prove unsatisfactory to the public, it is not inconceivable the result might be to cause all the lines in Canada to be turned over to private management. It will be noted that the officers of the Canadian National Railways are in the main the old officers of the Canadian Northern system. These men were the able lieutenants of Messrs Mackenzie and Mann. Why may not Messrs. Mackenzie and Mann, after the nationalization program has failed to vindicate the claims made for it, if it does, come before Parliament with an offer to take over this transcontinental system and operate it as a private enterprise in competition with the Canadian Pacific?

Messrs. Mackenzie and Mann in all of their business enterprises have shown themselves to be exceptionally shrewd, enterprising business men.

Orders of Regional Directors

PERMIT SYSTEM FOR CONTROLLING GRAIN SHIPMENTS.—Supplement 4 to Circular 247 of the Southwestern regional director states that, effective October 25, all grain shipments destined to Chicago, St. Louis, Mo., East St. Louis, Ill., Kansas City, Mo., Omaha, Neb., Council Bluffs, Iowa, St. Joseph, Mo., Fort Worth, Tex., and Milwaukee, Wis., will require individual permits. Rules are also promulgated in the order for the application for such permits and the form to be used.

Purchase of Material for Use After 1919.—Order 247 of the Southwestern regional director states that it is important that the director general should not be obligated for any material or supplies delivered to railroads after the termination of federal control. It is equally important that the delivery of material and supplies necessary for the operation of the railroads should not be seriously interfered with by the termination of federal control. A statement showing all of the outstanding unfilled orders or contracts, the delivery of which will not be completed by December 31, 1919, with the terms and prices of purchase, should be presented to the corporate officers of the railroads in order that the corporate officers may determine to what extent they desire to assume the obligations of the director general after the termination of federal control; and they should be requested to render a decision in writing as to which, if any, of the outstanding orders, they desire to assume. Upon receipt of this information the general purchasing agent should be instructed to immediately cancel the undelivered portion of any such orders which the railroad company has signified its unwillingness to accept and at the same time the shippers should be notified that the railroad company has assumed the obligation to pay for such material as is shipped after the termination of federal control. As soon as the railroad companies have signified their decision with respect to outstanding unfilled orders and contracts, they should be requested to authorize the federal manager or the general purchasing agent, as federal purchasing officer, in writing, to place orders for account of the railroad company for such material and supplies as may be necessary to insure the continuous operation of the railroad or designate a representative authorized to approve, on behalf of the railroad company, all orders for material and supplies which it is necessary to place after December 1, 1919, and the delivery of which will not be completed by December 31, 1919, and to obligate the railroad company to pay for such portion of the material as shall be undelivered on that date. No orders for material or supplies of any nature should be placed after December 1, without approval of the corporate officer so designated except in cases of emergency where the material is required for immediate use and where it will be delivered prior to December 31, 1919. All orders and contracts for the purchase of material should continue to carry the clause relating to their termination with respect to the director general, and in addition thereto all orders or contracts made subsequent to December 1, 1919, must have printed or stamped on their face the agreement of the railroad company to assume the obligation to pay for such portion of the material as remains undelivered at the termination of federal control.

Work of the Fuel Conservation Section

By Securing Co-operation and Without Issuing Orders, a Startling Saving Was Effected

By Eugene McAuliffe
Manager, Fuel Conservation Section, United States Railroad Administration

A STUDY of the railroad fuel situation made by the Railroad Administration early in 1918 developed a marked tendency toward increased consumption per unit of service rendered; this investigation also brought out the fact that the railroads receiving fuel coal from certain localities were being supplied with material of a quality far below that delivered in pre-war times. This situation not only added greatly to the fuel bill, but in addition very seriously interfered with the movement of heavy freight and passenger trains, with resultant general delay to traffic and marked increases in general operating costs directly chargeable to fuel conditions, were developed. It therefore seemed advisable to attempt at the very beginning the broadest possible campaign for the conservation of railway fuel, this program predicated on not only greater effort on the part of officials and men responsible for the use of coal and fuel oil, but in addition thereto the necessity for greater effort and care in the mining, loading and preparation of the fuel sent out from the mines was strongly emphasized.

That this important work might be taken up and carried to a conclusion along definitely determined lines, the Fuel Conservation Section of the Division of Transportation (now the Division of Operation), United States Railroad Administration, was created on May 1, 1918, and a manager, with offices in Washington and St. Louis, was appointed. The work assigned to the Fuel Conservation Section was that of "giving attention to the conservation of fuel on all railroads, with special reference to its preparation and proper use," as well as to "investigate and make recommendations in connection with the transportation of fuel and the handling of same at fueling stations."

Immediately after the creation of the section and before circular announcement of its existence could be made, the work of organizing for cleaner fuel and its more economical use was well under way, and the co-operation of the United States Fuel Administration was sought toward the prompt preparation of a program, which would bring quick results.

A Whirlwind Campaign

The International Railway Fuel Association, whose membership is almost wholly made up of railway operating officials and coal producers, was decided upon as representing the most forceful and direct instrumentality that could be employed toward securing the preliminary concerted effort sought, and on May 23 and 24, 1918, this association, setting aside its usual technical convention program substituted therefor a whirlwind campaign for better fuel and greater economy in its use. This meeting, covering two days, packed one of the largest Chicago theatres, taking the form of a great revival, and there men prominent in the mine labor world, together with men high in railroad labor councils, joined forces with railway operating and motive power officials, coal operators, fuel engineers, and others, specialists in their respective lines, urging not only the maximum possible production of coal, but that such coal that was loaded, be loaded as clean as it was possible to prepare it, contributing in this way the first essential element necessary to fuel economy. These appeals were supplemented by eloquently urgent requests that every man connected with the transportation, handling and consumption of fuel coal and oil, exert the maximum effort toward securing the best possible service from it.

The stirring addresses delivered at this convention were printed and mailed to every miner's home, to every mine office, railroad employers' lodge room, machine shop and roundhouse in the United States, with the result that the echo of the May, 1918, appeal for clean fuel and fuel economy reached every mine official in charge of coal properties, every mine employee engaged in the production of coal, and every railway official and employee in any way connected with the handling and use of same. Next to the several drives made by the Treasury Department in connection with the financing of the war budget, and the work of the Food Administration, the fuel economy drive of May, 1918, was, perhaps, the greatest general concerted effort made toward strengthening the hands of the Administration in the conduct of the war.

Simultaneous with the work done at the Chicago convention, men experienced in the handling of fuel, locomotives, and stationery plants were called to service in the several regions, and the office of assistant manager of the Fuel Conservation Section, with headquarters in New York City, was established to take charge of the work in the Eastern regional district, in which territory the maximum amount of fuel trouble had developed; the measure of freight and passenger traffic handled in the Eastern region was also heavier than that handled in any one of the remaining six regions.

To cover the Allegheny, Pocahontas, Southern, Northwestern, Central Western and Southwestern regions, the office of regional fuel supervisor was created in each region, and the necessary assistants and office force were provided for each region. A survey of the fuel inspection forces of the several railroads was quickly made and arrangements consummated with the United States Fuel Administration, whereby each field inspector was furnished a credential authorizing him to act in behalf of and for the Fuel Administration, as well as the Railroad Administration, in the matter of securing the proper preparation of fuel coal, the Fuel Administration withholding equipment from certain mines and shutting down others which refused to establish the standard of preparation commonly maintained in their immediate fields.

Strengthening Field Inspection Forces

More recently the work of co-ordinating the efforts of the individual railroad fuel inspectors, to the end that fuel found to be of inadequate preparation or quality and declined by one road, would not be accepted by another, thereby standardizing inspection methods, has been worked out, and with the extraordinary increase in the price paid for fuel f. o. b. cars at mines compared with that paid in the pre-war period, plus the additional expense incident to hauling same, greater discrimination in the purchase and acceptance of coal has been strongly urged on those responsible for the fuel supply.

This strengthening of the field inspection forces was immediately reflected in the shape of reduced motive power failures, decreased operating expense, and a decrease in the unit consumption of fuel. In the meantime, the assistant manager in the Eastern region and the fuel supervisors in the other six regions, with their assistants, undertook the

work of calling together on each railroad all officials who were in any way connected with the transportation and use of railway fuel, again urging the greatest possible measure of co-operation, including the better maintenance of, and the proper rating of locomotives, the elimination of terminal and intermediate station delays; supplemented by such simple direct supervision and education of the many new employees whose entrance into railroad service was made necessary by the movement of the great volume of troops, munitions and other war business, as well as those employed to take the place of the thousands of experienced men who had left railway service to enter the combat force. The patriotic assistance of the heads of the several railway brotherhoods, as well as that of the mine workers, was also solicited, these appeals meeting with a wholesome and hearty response.

How Co-Operation Was Secured

In connection with the work of directing the more economic consumption of fuel on locomotives and in miscellaneous fuel consuming plants, a definite line of procedure was laid down, this program including a complete abstinence from anything that savored of bureaucratic methods, and from the date of the inception of the Fuel Conservation Section to this time, not a single positive order has been issued by any representative of the section to any official or employee engaged in the operation of the railroads under government control. On the other hand, every suggestion involving novel and untried methods toward fuel conservation was denied support, the fundamental principle underlying the work of the section being that of securing the adoption on the part of every official and employee of the best of the several methods proven and commonly in use on the several railroads, which, in substance, meant nothing less than more vigorous effort along the lines, and in the manner the individual roads had previously laid down as representing the best line of conduct.

The full support of all operating officials has been given to the work of saving fuel as a result of the simple, concise presentations made by the section, many federal and general managers now leading the work on their respective lines. In connection with the field methods employed in improving the quality of the coal loaded at the several mines, no unreasonable demand has at any time been made on either the coal operator or the mine employees, and a full recognition of the limitations that attach to the mining of coal has invariably been accorded the mining industry; nor has any demand whatever been made toward the transfer of fuel purchases from the mines or localities established during the pre-war period as the logical and proper source of fuel supply for the several railroads. To this broad recognition of the acknowledged skill of both coal mine and railway officials and employees, is due to the extraordinary measure of co-operation accorded the section, and no claim for credit can be made by the section with respect to the results obtained, except that which is due the working staff of the section who have, in every instance considered themselves, not only as responsible to the Railroad Administration, but to the operating heads of the several roads located in their respective regional districts.

Supplementing the general work above referred to, the campaign toward fuel economy was conducted and exemplified through divisional meetings of officials and employees, at which time specific results of progress made were presented through the medium of comparative divisional and system fuel statistics, studies made of fuel used on individual locomotives, the savings obtained at individual power plants, etc. Fuel conservation committees were organized on many roads, employees as well as officials making up the personnel, all of which have done splendid work. Road tests were conducted from time to time, and the more serious operating and maintenance disabilities affecting fuel consumption were located and brought to the attention of officials and employees in a brief, concise way, with suggestions for such remedial measures as could be employed without heavy capital or labor expenditures.

These investigations and studies, including the losses due to air ingress and steam leaks in locomotive front ends and front end apparatus, with consequent reductions in the size of exhaust nozzles entailing back pressure losses, which in turn lead to fuel wastes and decreases in tractive power; losses sustained by the inadequate maintenance of superheater equipment and the adequate maintenance of grates and ash pans; losses due to the improper adjustment of locomotive front ends, and those incident to the operation of locomotives suffering distorted and defective valve motion, were all clearly brought out and remedies were suggested through several circulars setting out the results of the specific tests referred to above which were made by the Fuel Conservation Section in connection with motive power officials.

A special circular covering the maintenance and operation of stationary plants was also prepared for the use of men in charge of, and handling same and a circular covering approved methods of storing coal, to the end that storage losses be reduced to the minimum, was prepared and placed in the hands of officials in charge of this work, and a further special circular on the maintenance and operation of locomotive stokers was recently published for the use of roundhouse and locomotive men.

Careful investigation of the fuel losses sustained by inadequate air brake maintenance developed that an annual loss of over 6,000,000 tons of coal was being suffered from leakage of air in brake pipes and connections under freight cars. The section therefore arranged for a study of the best method of preventing these losses, which was made by a volunteer committee from the Air Brake Association. Specific recommendations were prepared directing the attention of yard repairmen and freight train employees to the serious fuel loss susatined from excessive air line leaks, as well as the methods which should be employed to overcome same. In this manner the campaign for fuel conservation was carried directly into the car repair department, the yard masters' offices, and to the men in the freight train cabooses. In no instance was the influence of the maintenace of way men lost sight of.

Fuel Consumption Statistics

A growing amount of fuel oil is used in certain sections of the country for locomotive and miscellaneous fuel purposes, and special attention has been given to the more economical consumption of fuel of this character, the majority of the items adversely affecting the consumption of fuel coal equally affecting the use of fuel oil. Through its Washington office the section early arranged for the assembling and compilation of such statistics of fuel consumption as would, when published, not only show the operating officers of each road just what was being accomplished on their individual lines and in their respective regions, but, in addition, these statements set out the results obtained on all roads under government control, thereby enabling each federal manager to judge the results obtained on the particular road under his direction when compared with those obtained on other lines whose grade conditions, volume of traffic, etc., made such reasonably comparable.

These statements, distributed monthly with a quarterly and annual cumulative statement, represent the most complete fuel performance presentation ever published. During the year 1917 the pounds of fuel used per 1,000 gross freight ton miles and per passenger train car mile, when compared with the 1916 performance, showed an increase approximating five per cent, and by the middle of the year 1918 this

increase in consumption had grown to a point approximating eight per cent over the 1916 performance, but in July, 1918, the effect of the personal inspiration received by railway officials at the big Chicago meeting, and the results obtained from the sending out of some 2,200,000 copies of the appeals made at that meeting, began to show in the fuel performance, until at the end of the year 1918 the losses sustained during the first half of the calendar year, in part due to extremely rigorous winter weather, were caught up, and a saving totaling $19,231,000 stood as a credit to the efforts toward fuel economy made by railway officials and employees.

Tremendous Saving

During the year 1919 the program determined upon at the inception of the work has been maintained throughout and the stride toward lower unit fuel consumption which began with the May, 1918, Chicago meeting has been quickened. An estimate of the total saving which will be made in 1919, when compared with the previous year, based on the progress made in the first nine calendar months of the year, indicate the following results:

Class of Service	Consumption Tons	Saving Tons	Saving Value
Freight	72,098,000	5,993,000	$20,687,000
Passenger	29,615,000	2,524,000	8,714,000
Switch	20,310,000	986,000	3,409,000
Miscellaneous	16,643,000	1,395,000	4,803 000
Total	138,666,000	10,898,000	$37 613,000
Saving in reduced haul on users' rails at 75 cents per ton			8,176,000
Total savings			$45.789,000

The fuel bill of the Railroad Administration for the year 1919, exclusive of any increase in mine price that may be occasioned by changes in the miners' wage scale taking effect in November and December, 1919, will approximate (including an allowance of 75 cents per ton for company haul) a total of $665,000,000. Unless checked by a decreased unit consumption it will in a few years reach the billion dollar mark. The 1919 fuel (fuel oil reduced to the basis of coal) would, if put into standard capacity coal cars, make a train 26,261 miles long, a distance materially exceeding the circumference of the earth. The fuel saving of this year would make a train of 2,064 miles long, extending if coupled up solid from New York to Chicago by way of the Pennsylvania, thence back to New York by way of the New York Central and doubling back on the New York Central to Albany. The value of the fuel saved would buy 763 modern heavy type locomotives or 15,263 modern freight cars.

Measured in area of coal land exhausted it represents a territory approximating 2,178 acres in extent. Thus far our comparisons have been of the major variety, but the real results have been accomplished by using *one less scoop full of fuel one and a half billion times.* The Fuel Conservation Section has contributed toward the dissemination of certain fundamental principles, among which can be mentioned the success that will always result from concerted effort, the effort which individually examined seems small, but when totaled assumes splendid proportions. That the influence of the work done in 1918 and 1919 will continue there can be no doubt, as many of the suggestions made were of a character that will insure their permanence. The Fuel Conservation Section has fulfilled the expectations of its creators; it has fully justified the outlay involved to maintain the organization, a sum equivalent to approximately three-tenths of one per cent of the value of the *fuel saved* in 1919.

OPERATION OF PANAMA CANAL.—During the fiscal year ended June 30, 1919, the ordinary expenses for the operation and maintenance of the Panama Canal, including those of civil government and sanitation, amounted to $6,121,194, as compared with $5,920,342 in 1918 and $6,788,047 for 1917.—*"Nauticus."*

National Industrial Traffic League Convention

THE ELECTION OF OFFICERS and the reports of special committees, especially the committee appointed to report on the Cummins bill as the legislative solution of the railway problem, were the high lights of the annual meeting of the National Industrial Traffic League held at Chicago on November 12 and 13. A significant feature of the convention was the interest displayed by these present in the solution of the present railroad problem as compared with their interest in subjects confined wholly to the different phases of shipping and transportation.

Legislative Recommendations

C. E. Childe, chairman of the legislative committee of the league and also chairman of the special committee appointed to report on the Cummins bill presented the reports for both committees of which he is chairman. Among the recommendations made by Chairman Childe in reporting for the legislative committee are the following:

"On the question of cancellation of war tax on transportation charges, the committee recommends that the league oppose the cancellation of such tax at this time and the committee's recommendation was upheld by the members at the Milwaukee meeting.

"There are now pending in Congress several bills designed to suppress bribery and other corrupt practices in interstate and foreign commerce, namely, House bill No. 263 by Mr. Sims; Senate bill No. 54 by Mr. Fletcher, and Senate bill No. 1024 by Mr. Cummins. Bills are now in the hands of the Interstate Commerce committees of the House and Senate and will be acted upon after the general railroad legislation is disposed of. The purpose of all three of the bills above mentioned is to forbid the giving of any gratuity or thing of value as an inducement, bribe or reward to influence the actions of any employee or agent in relation to the affairs or business of any employer or principal engaged in or affecting interstate commerce, and further forbidding the receiving of such gratuity by any such employee or agent. The American Bar Association has endorsed the general principles of these bills at its meeting in Boston in September, 1919, without recommending any one in particular in preference to another. The principal interest of the league members in these bills lies in the fact that they would suppress the giving of bribes or inducements to railroad employees to influence the handling of cars or shipments, and would make it unlawful for railroad employees to accept bribes from shippers. Your committee recommends that the League strongly endorse the general principle of this legislation to the end that the soliciting of bribes by railroad employees and giving of such bribes by shippers may be effectually done away with and that the interstate commerce committees of Congress be notified accordingly.

The report of the special committee appointed to analyze the Cummins bill as the legislative solution of the railroad problem, did not go into exhaustive explanation of the details of the bill but confined its analysis to certain objectionable features. Recommendations were prepared by the committee to eliminate these features of the bill and the report as presented to the convention was summarized as follows:

"Your committee believes and recommends to the membership that since the Esch-Pomerene bill includes in the main the good features of the Cummins bill and omits its bad features, the Esch-Pomerene bill should be advocated by shippers as a basis of railroad legislation to be passed by Congress, rather than the Cummins bill."

In arriving at this conclusion the committee presented an analysis of the objectionable features contained in each section of the Cummins bill and the reasons for its recommendations in each case. In presenting the report Chairman Childe stated that the references to the Esch bill were to the bill before it was revised in committee and pointed out the differences in the House bill before and after this revision. After

some discussion it was voted that the executive committee of the League be instructed to report to the members by circular its conclusions as to the Cummins bill and the revised Esch bill and that recommendations be made to senators and representatives not only by the executive committee, but by individual members of the League.

Other Committee Reports

Among the other reports presented and accepted by the convention were those of the special committee on minimum class rates, the committee on car demurrage and storage, the express committee, the bill of lading committee, the classification committee, the special committee on coke and coal claim rules, the membership committee, the special committee on through export bills of lading, the committee on inland waterways, the demurrage committee, a sub-committee of the demurrage committee to consider storage rules and the committee on freight claims. In connection with the discussions following the report of the last committee, Max Thelen, director of the Division of Public Service, United States Railroad Administration, who was present, stated that the 887,197 loss and damage claims unpaid on March 1, had been reduced to 486,492 on September 1; the 363,476 loss and damage claims unpaid over four months old, on April 1, had been reduced to 193,642 on September 1, and the overcharge claims unpaid and 90 days old had been reduced from 72,215, on January 31, to 14,721 on September 30.

Resolutions Adopted

Among the resolutions adopted by the convention were the following:

A resolution, offered on the instruction of the executive committee, endorsing Commissioner E. E. Clark for reappointment on the Interstate Commerce Commission.

A resolution, submitted by the legislative committee at the direction of the executive committee, declaring that the Railroad Administration was not abiding by the terms of Reparation Circular No. 7, issued by the director of the Division of Traffic, United States Railroad Administration, and protesting against having to submit proof other than that charges were unjust and unreasonable.

A resolution offered on the recommendation of the export and import committee expressing opposition to the Greene bill (H. R. 8873), which was characterized as an attempt to modify the present mortgage law.

Election of Officers

The election of officers for the coming year necessitated the re-arranging of the usual election plan because of the peculiar situation arising through the re-election last year of President G. M. Freer. The custom has been to advance the vice-president to the presidency each year, but W. H. Chandler, vice-president last year, was not advanced to that position at the end of President Freer's first term as president. The re-election of the latter and the election of R. D. Sangster as vice-president at that time presented the problem of how the League could advance its vice-president in the usual manner and at the same time allow Mr. Chandler to serve the customary term as president. As a result of this situation a representative nominating committee was appointed to bring in a list of two candidates for every office to be filled. Mr. Chandler and Mr. Sangster were both nominated for the presidency and the election was held on the last day of the convention. As a result of this election the following officers were elected: President, W. H. Chandler; vice-president, C. E. Childe; treasurer, O. F. Bell; honorary vice-president, New England territory, C. B. Baldwin; Trunk Line territory, W. J. L. Banham, George P. Wilson, G. F. A. territory; F. H. Baer, G. L. Cory, D. O. Moore, F. E. Williamson; Western territory, P. W. Coyle, Seth Mann; Southwestern territory, U. S. Pawkett; Southern territory, J. S. Davant; Southeastern territory, W. W. Ingalls, Jr

Address of Max Thelen

The convention was concluded on the afternoon of November 13, and the members attended the annual dinner of the Traffic Club of Chicago in the evening. Max Thelen, director of the Division of Public Service, was the principal speaker at the banquet. Mr. Thelen asserted that, had there been a normal amount of freight traffic during the first six months of 1919, the government would have broken even, or nearly so, from its operation of the railroads this year at the rates now in effect. He predicted that the freight business for the first six months of 1920 would be much heavier than the abnormally low business during the first half of 1919.

"Bearing in mind this increased traffic, which we have every reason to expect," said Mr. Thelen, "it is clear to me that if the government continued to operate the railroads in 1920 it would be unnecessary to make any increase in rates or fares."

Referring to the bad-order freight car situation Mr. Thelen announced that the total number had been reduced from 228,549 on August 16, to 146,702 on November 1. However, the Railroad Administration will not relax its efforts to still further reduce the percentage of bad order cars as long as there is any reasonable grounds for believing that the situation can be improved, Mr. Thelen said.

Referring to the freight business as a whole during the month of October, the Railroad Administration transported a larger amount of freight than during any other corresponding period in the nation's history.

"During the week ending October 25, the Administration transported coal estimated by the Geological Survey to have amounted to 13,118,000 tons, the largest amount transported during any week in the history of the country," said Mr. Thelen. "During the week ending October 4 the Administration transported 7,869 loaded revenue cars more than during the same week in 1918; during the week ending October 11, increased loads were only 2,293, but during the week ending October 18, there were transported 42,125 loaded cars in excess of the number transported during the corresponding week in 1918, and during the week ending October 25, the increase amounted to 67,222 cars. Finally during the week ending November 1, the last week for which figures are available, there were transported 80,400 loaded freight cars in excess of the number transported during the same week of 1918. For the month of October, as a whole, there were transported, in 1919, 200,000 more loaded cars of freight than in 1918. I also invite your attention to the fact that the car shortage was considerably less in 1918."

Mr. Thelen stated that he was in favor of the return of the roads to private ownership at the earliest practicable date, giving as his reasons that it is absolutely essential to construct at the earliest possible date a large amount of new equipment —freight, passenger, baggage, and express—to meet the deficiencies in construction during the last three or four years and to assist in taking care of the tremendous volume of business which will undoubtedly be offered for transportation in 1920.

In concluding his address, Mr. Thelen urged that the public make a careful survey of the results accomplished by the Administration and insist that whatever of value has been made effective during federal operation should be retained under private operation. Among these were the pooling of equipment, the unification of terminals, the retention of consolidated ticket offices, the retention by the carriers of the right to disregard routing instructions wherever necessary to relieve congestion, the permit system, the elimination to a large extent of competitive train service and the retention of the traffic committees which have recently been appointed by Director General Hines.

Problems Involved in Return of Railroads

Mere Relinquishment Not Sufficient. Legislation Must Provide for Adequate Development. Some Lessons Learned

By Brice Clagett
Assistant to Director General of Railroads

SOONER OR LATER—probably on January 1—government control of the railroads of the United States will terminate and the roads will go back to the management of their private owners. And simultaneously, if past expressions of sentiment mean anything, the American people will heave a sigh of relief. "Get the government out of the realm of private business," the people have said, and so the government is getting out, at least is getting out of the direct, day-by-day management of the railroads. Unless the Congress shall extend the period of government control, we are going to have private operation again and naturally we ought to know as accurately as possible what the change will mean.

The really big lesson which must be learned, if we are to obtain satisfactory railroad service, is that something more must be done to remedy conditions than merely turning the carriers back to private control under the same form of legislation in existence prior to government operations. The idea has grown up that once the railroads go back to private management all the ills will disappear. That trouble started when the opponents of government ownership over-played their hand. They set out to prove that the government could not successfully run the railroads and they ended by convincing almost everyone that everything that has gone wrong with the railroads during the last two years has been due to government control.

Problem Before Congress

Congress just now is wrestling with the problem of whether government control is to be continued, or just what kind of private control we are to have. On the outcome of the action of Congress will depend in large measure whether the railroads are to give satisfactory service or whether the troubles existing before the war are to be repeated. But, meanwhile, it may be possible to learn something of what has been disclosed by government operation—something of what the change back to private control promises the public.

So far as the general public is concerned, its interest in the railroads is that satisfactory service, both passenger and freight, be rendered as cheaply as possible. The traveler and the shipper, and through the shipper the ultimate consumer, want trains run on time, want courtesy, want cheap rates, want safe service. None of these things can be secured unless the railroads are able to get the money to make the necessary additions and betterments, buy the badly needed equipment, put the roads on a financial basis they have not had since long before the war; they cannot be solved unless the railroad companies treat labor fairly and take advantage of the lessons learned during government control.

The sooner the idea is dispelled that all the railroad difficulties of the last two years have been due to government operation, the quicker will the railroads get on their feet again. One does not have to be an advocate or believer in permanent government ownership or control to honestly believe that. Already there are beginning to be signs that the real facts are being understood.

Before government operation began we believed we had private control, and in a sense we had—but only in a sense. The income of the railroads—the rates—were controlled by national and state governmental bodies. The service—the operations—were being more and more controlled through national and state hours-of-service laws, safety appliance laws, various regulations and statutes. The government controlled, but did not take the responsibility.

However much the blame may have rested on the few railroad owners who betrayed their trust and prostrated great properties, the fact remained that long before government operation began the public generally had begun to appreciate that something had to happen or railroad troubles were ahead.

The War Task of the Railroads

Then came the war, and after the war had lasted something more than six months the troubles became so manifest that the government stepped in and took over the operation of the railroads. What would have happened had the government stayed out it is impossible accurately to say. It is sufficient to remember that compelling demands for increased wages were pending, many of the railroads were facing bankruptcy, conflicting government priority orders and lack of unification among the railroads were throwing traffic into confusion, and there was not sufficient equipment to handle normal business, let alone the vast war needs. Time after time have I asked some of the biggest railroad men of the country what would have happened had the government not taken over control of the railroads. The answers have been varying, but in one respect they have been uniform: the railroads could not have carried the load had they been continued under the old laws and regulations and diversified control.

Government control accomplished one thing if it accomplished nothing else. Under it the railroads handled the war business without faltering. Forget for the moment the inconveniences which you suffered or read about; forget the wage increases so widely advertised; forget the lack of individual attention; forget the government railroad deficit. Remember that primarily the railroads were placed under government control to help win the war, and see how they measured up to that standard.

This is neither the time nor the place to go into details on the accomplishments of government control. But the country perhaps should remember always that its railroads, operated by trained railroad men temporarily under direction of the government moved 13,446,859 soldiers and sailors and marines from January, 1918, to November 1, 1919. If there has been a serious complaint about how the troop movements on America's railroads were handled I have not heard of it. From home to camp and cantonment and from cantonment to port, sometimes across the entire continent, then back from port to camp and lastly on reduced fare discharge certificates home again, virtually every man who enlisted or was drafted into the army or navy of the United States was moved one or more times on an American railroad in comfort and in safety, adequately fed, delivered on time.

Perhaps the picture may be more vivid if it is remembered that 213,749 railroad coaches and Pullmans were used in

* Abstract of an article published in the Philadelphia Public Ledger of November 16, 1919.

these troop movements, that 18,400 special trains were operated and that the movement was equivalent to transporting one passenger 5,917,658,719 miles.

An then the other branch of the war work of the American railroads—the movement of war supplies. There has been no complaint about this. The country was not told, could not be told, how in the spring of 1918 the allied ambassadors at Washington, backed by telegrams from their premiers, told the director general of railroads that the Allies would lose the war if a certain amount of foodstuffs was not moved to the Atlantic seaboard in a certain number of days. Empty freight cars were rushed to the West—an expensive movement—and rushed back again in long trains, loaded, and before the time was up the allied ambassadors had to call a halt because they did not have ships enough to load the foodstuffs piling in on them.

In brief, it has never been denied, and I think never will be denied, that at least so far as handling war business is concerned—the business they were taken over to handle—the American railroads under government operation performed their job in true American fashion. And in saying that I mean much more credit to the officers and men out on the road than to the few who happened to be in Washington directly representing the government. I mention it not to uphold government control of railroads, not to praise any man or group of men, but entirely because I earnestly believe that, unless what government control of railroads did accomplish and failed to accomplish is clearly understood and the record made, there will be no satisfactory settlement of the problem now before Congress and the people.

To learn what the change back to private operation involves, suppose we see what the chief complaints against government operation have been and then examine them to discover whether they can be cured merely by a change from government to private operation, or whether we have got to have more than the old private operation we had before the war.

Charges Against Government Management

Broadly, these are the charges against the railroads under government control as I have recognized them in the newspapers, in debates in Congress, in resolutions of trade bodies, and in conversation from one end of the country to the other:

First. The government-controlled railroads have lost money and have incurred a deficit to be paid by the taxpayers. (This deficit I have seen stated at anywhere from $500,000,000 to $5,000,000,000.)

Second. Rates have been too high.

Third. Wages of railroad employees have been increased too much.

Fourth. The railroad properties have been run down.

Fifth. The service, both passenger and freight, has deteriorated, and employees have been less polite than under private control.

So that there may be no misunderstanding of the facts, let it be said immediately that after paying operating expenses and paying to the railroad corporations rental of approximately $940,000,000 a year or approximately $1,880,000,000 for the two years of government control, the net loss to the government on account of operating expenses will be about $236,000,000 for 1918 and $250,000,000 for 1919, or a total of $486,000,000 for the two years.

Put the operating loss for the two years down at $486,000,000 and the figure will be as near as it is possible to estimate until government control is actually wound up.

What are the compensations for that loss? The primary compensation has been that the railroads were kept in a position to adequately perform the war business of the nation at a time when failure to carry on that business would seriously have endangered the outcome of the war. One minor result was that a large proportion of the soldiers and sailors in the United States, in many cases distant from their homes, were able to visit their families on reduced fare furlough certificates.

Rates Kept Down

One other major compensation was that railroad rates were kept down and, therefore, a restraining hand held on the cost of living—which in all truth needed a restraining hand. Another result was that railroads were enabled to keep their employees at a time when shipyards and other war industries were paying extremely high wages to attract skilled men. Without a decided increase in rates undoubtedly it would have been impossible for the railroads under private control to have granted any such wage increases as were allowed by the railroads under government control.

The big losses came in the spring of 1918 and the spring of 1919. In the spring of 1918 rates were the same as they had been under private control, although under war conditions prices were constantly mounting. In the spring of 1919, the spring following the signing of the armistice, business had fallen off alarmingly. At the present time, and since July, with unusually heavy business, the government is making money out of the railroads; making money, but not enough to compensate for that lost in the early months of the year.

From articles appearing sometimes in newspapers it is apparent that there is some misunderstanding as to how much freight and passenger rates have been increased under government control. The fact is that, considering the country as a whole, passenger rates have been increased approximately 25 per cent and freight rates have also been increased approximately 25 per cent. When it is remembered that the cost of practically everything entering into railroad operation has been increased more than 25 per cent, it is evident that this increase in rates has not been extravagant. While the charge to the public for railroad transportation has increased 25 per cent, it is evident that the charge for practically everything else in the country has been increased in the same period decidedly more than 25 per cent.

Increase in Wages

As to the charge that railroad wages have been increased too much, here again it is necessary to get at the actual facts, and I think that I cannot do better than to quote from a recent address which has not been published to any extent, made by Mr. Walker D. Hines, the director general of railroads:

"You have heard a great deal about extreme cases of increases in pay to the railroad employees. In that, as in so many other things, it is the extreme cases that are dwelt upon, whereas in a matter of this sort, we must look at the general situation. The general situation is that the average increase in rates of pay which has been made for railroad employees throughout the United States has been about 50 per cent over the rates of pay which were in effect in December, 1917. I have yet to learn of any important industry which has shown a more conservative average of increase in pay in the same time, in view of the war conditions which made increases in pay both proper and necessary, and while this increase in the rate of pay has been about 50 per cent, the increase in the earnings per individual has been less than that, because the number of hours the individual employee works is less than the number of hours he was working in December, 1917, under the war pressure then prevailing and under the longer hours which were then established.

"I think it is a mental habit that all of us have got into - -on account of my peculiar situation I suppose I have escaped it—to assume the government's treatment of the labor question is bad because the government did it, and then

assume that the government control is bad because it treated the labor movement like it did. I think I have seen a great many comments running around in a circle that way.

Covenant to Be Fulfilled

As to the claim that the railroad properties have been run down under federal control, it should be remembered that the contract which has been made with a large proportion of the railroad corporations and which is based upon the federal control act, provides that the properties shall be turned back in the same condition as they were when they were taken over, and contains the covenant that if it desires the government can satisfy this provision by spending on each property the same amount as was spent on the average in the test period, taking into consideration the changed prices for labor and materials. The government, of course, will fulfill this covenant.

On some railroads it has already been fulfilled; on others, adjustments in money may be necessary. On some railroads the way and structures are in better condition today than they were prior to government control, whereas the equipment is not in such good condition, and on other railroad properties the contrary is true. The process of carefully checking up on each property has been in progress for months past, and the figures plainly show that, taking the country as a whole, the government should be able easily to satisfy its contract obligation and return the railroads of the country to their owners in substantially the same condition as when they were taken over.

The next serious charge against government control has been that, under it, service has deteriorated, and that employees have been less polite and attentive. To take up that charge we should divide government control into two parts; first, the part during the war and immediately thereafter, and second, the period after the soldiers got home and the country began to do peacetime business again, say since July 1, 1919.

Early Deterioration Admitted

During the first period railroad service, meaning the everyday service to the individual civilian passenger and shipper, did deteriorate. There is no use trying to disguise the fact, nor is there any object in doing so, and we must face facts if we are to know what is to happen after government control is over. After watching the situation closely, month after month, reading innumerable letters, going through newspaper editorials from every state and town, traveling on the railroads in all parts of the country, I firmly believe that the deterioration in service during the war and immediately thereafter was due, in a small degree, to government control, and to a much larger degree to the war and consequences of the war.

The part that was due to government control did not result from anything the government or any one representing the government did, that could have been avoided, as I see it. One reason was the lack of the competitive spirit. The other was the drawing in of solicitors and traffic representatives. As a result of the latter, many shippers who had previously been given special attention no longer received it. The part that was due solely to the war was involved in the loss to the army of many skilled employees, to the use for strictly war purposes of equipment, which otherwise could have been used for civilian and business purposes, to the necessity of putting civilian and business needs always behind war needs.

But when preparing for what is to come after government control the comparisons should be made not with the period 18 months ago, when the war was at its height, or with the period in the spring when business was just getting over the effects of the war, but with the last few months, when peace had been more fully restored.

The fact is that the difficulties as to service which exist now are difficulties which will be very slightly influenced merely by turning the railroads back to private control. Some of those difficulties are more apt to be increased than diminished. Leaving aside the personal attention which can be given by traffic solicitors and which undoubtedly will be increased under private control, the railroad plant of the country has been functioning with unusual facility for the last few months. Competition, to a certain extent, already has been restored even under government operation. Both within and between regions, railroads are trying to get more trains on time, and as a result, during September 88 per cent of all the passenger trains of the country were either on time or made their runs in as good as, or better than, schedule time. Before the coal strike the railroads of the country were doing a heavier business than was ever done before. The bad order car situation on November 1 was down below 6 per cent. There were more than 1,800 locomotives in repair and in storage awaiting use. And in the last week before the coal strike, meeting the emergency presented, the railroads hauled more bituminous coal than ever before, 13,200,000 tons.

From the above do not think I believe that the railroads of the country have given perfect service during the last few months. I do not. I realize, of course, that for a time there was a shortage of cars to move coal, and that there is still a shortage of cars for the movement of grain and some other commodities. I appreciate there are other difficulties. But these are difficulties of the railroads rather than difficulties of government operation.

The railroads need equipment, they need all sorts of additions and betterments, they need to spend from $750,000,000 to $1,000,000,000 in the year 1920, they need to make extensions into new territory. But those are needs of the railroads whether under government or private operation. Turning the railroads back to their owners will not get those things unless there goes with the turning back legislation which will permit the owners to get the money to do those things; unless there goes with the turning back legislation which will perpetuate some of the consolidations, some of the unifications, some of the saving which has grown up during government control and which should be added to under private control rather than wiped away; unless there goes with the turning back real constructive legislation, rather than makeshift legislation and the thought that the return to private operation will cure all the ills.

Need for Improvements

During the last year of private control in 1917 and during the two years of government control there have not been the needed additions and betterments and the needed equipment.

The railroads during the last year of private control did not have sufficient money to make these improvements, and during the war they were not made, first, because of the shortage of materials and labor; second, because of the lack of needed appropriations; and third, because in the closing months of federal control it was impossible for the government to make plans when its tenure of control was limited.

Virtually all of these reasons would have applied to the railroads had they been under private control during the entire period of the war, but this does not change the fact that now that the war is over and the railroads are about to go back to private control some steps must be taken to put the railroads on such a basis that they will be enabled to make the necessary additions and betterments and buy needed equipment, so that a really adequate public service may be given not only in the year 1920 but in years to come.

The fact is that if the railroads are to give adequate public service after government control they must adopt many

of the plans which have been worked out during government control. They will want to retain many of the consolidated ticket offices and consolidated terminals; they will want to continue the elimination of many circuitous routes previously employed; they will want to continue the pooling of repair shops; it is to be hoped that they will want to continue the permit system for the loading of grain and certain other commodities which prevents the use of railroad equipment for warehouse purposes; many will want to continue the utilization of universal mileage books; to a degree at least, they will want to push forward the standardization of equipment; certainly many will want to continue the maintenance of common time-tables between important points; they will want to continue the promotion of standard operating statistics to bring out the various elements of railroad efficiency. They will want to continue and possibly further develop the control over equipment, particularly over freight cars, so that the entire nation may get the benefit of the equipment in existence; they will want to go on with a score or more of developments which had either not been developed under private control or had been prevented by laws and regulations or over-developed competition.

Through co-operation between the Railroad Administration and the American Railroad Association during the last few months many of the improvements developed under government control seem certain to be continued, whatever legislation is adopted; but what is really needed for the service of the public is the development of really adequate legislation which will permit the making of needed improvements and the purchasing of the necessary equipment, and which will put the entire railroad plant at the service of the entire country. Unless these things are obtained the mere passing back to private control almost certainly will prove a snare and delusion.

War Blamed for Losses

To sum up, therefore, the large proportion of the money lost by the government in operating the railroads has been due to the war and to readjustments following the war and, the situation having changed, this condition will neither be bettered or made worse by the return of the railroads to private control. There may be some economies in operation brought about, but this will be largely offset by losing the economies of unified control; the rates control; the physical condition of the properties will not be bettered under private control unless the railroads are placed in position to secure money; the service, both passenger and freight, may be bettered under private control as far as individual attention is concerned, but can hardly be bettered as far as the aggregate service to the public is concerned; certainly it will not be bettered or even kept as good unless the railroad companies retain many of the unifications, consolidations, etc., which have been built up under government operation.

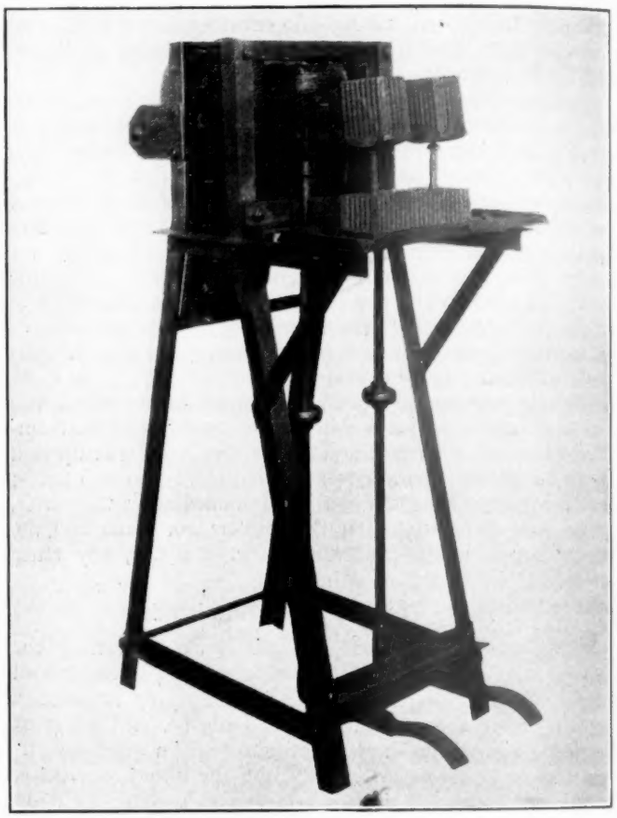
Whether the Congress decides upon returning the railroads back to their owners under virtually the same legislation in existence prior to government control; whether government ownership is adopted; whether federal control is continued for a year or more or whether really radical legislation reconstructing the existing railroad companies is put into effect will be determined during the present session of the Congress.

All of the proposals mentioned have received strong support. It is to the highest degree important that the public decide as promptly as possible which of these proposals will give after January 1 the most adequate railroad service to the country.

THE PRODUCTION OF PETROLEUM in the United States in October, 1919, amounted to approximately 33,319,000 barrels (barrels of 42 gallons), as compared with 33,667,000 barrels in September, 1919, and 31,255,000 barrels in October, 1918.

An Electric Rivet Heater

IN AN EFFORT to reduce the waste and losses experienced in present methods of heating rivets, as well as to provide a portable machine which may be used in localities where electric power is available and where fire, gases and smoke cannot be tolerated, the General Electric Company, Schenectady, N. Y., has designed an electric rivet heater which includes a transformer rated at 15 kw. mounted on angle iron legs which may be fitted with wheels. At the front of the transformer two copper bars are fitted with heavy air-cooled electrode blocks of cast copper and under these is another copper block which acts as a support and electrical connection for two rivets in series. When the rivets are placed on the block and the electrodes are allowed to drop on the heads of the rivets the circuit is closed and the heating begins. The two electrodes may be raised independently by two-foot pedals and a primary top switch mounted on the back legs of the machine compensates for the different diameters and lengths of the rivets. Higher efficiency owing to the localizing of the heat energy, better regulation of heat, elimination of smoke and gases and the losses due to uneven heating and consequent failure to upset in the hole, thereby causing a leaky rivet hole, are some of the more important advantages claimed for the machines.



Front View of the Rivet Heater

SAFETY-FIRST WITH TEETH IN IT.—At Altoona, Pa., on the fifth of December, five employees of the Pennsylvania Railroad were arrested by railroad police officers and arraigned before a magistrate who fined them each $1—merely the amount of costs in the case—for walking on the tracks. These employes of the road, taking a short cut from their work to their homes, crossed the yards at the eastern end, in violation of a well-known rule. The magistrate reprimanded the men for thus needlessly exposing themselves to being struck by trains.

Annual Meeting of the National Safety Council

Discussion of Industrial Relations Occupies Important Place in Convention Sessions

LABOR UNREST AND COLLECTIVE bargaining for a time usurped safety's place in the sessions of the Eighth Annual Congress of the National Safety Council held at the Hotel Statler, Cleveland, Ohio, October 1 to 4 inclusive. Organized primarily to promote safety among workmen in industries, the National Safety Council has been forced to widen the scope of its activities and enter the broader field of industrial relations because of the labor developments during the past year. For this reason the discussion of labor problems occupied a prominent part in the proceedings of the general sessions of the congress and in many of the sectional meetings. Both sides of the present economic struggle between employee and employer were presented to the delegates, the result being an open and entirely frank discussion of the fundamental causes of this unrest and of the principles of real democracy in labor.

The steam railroad section led all other sectional meetings both in point of attendance and in the interest displayed by those present. The largest available meeting room was assigned to this section for its meetings of which there were three; nevertheless, at each of these meetings the room was overcrowded and many railroad safety men were forced to remain outside.

R. C. Richards, President National Safety Council

The congress was opened on Wednesday morning October 1, by the annual meeting of members at which the chairman, David Van Schaack, president of the National Safety Council, presided. Thereafter four general sessions were held, two of which were devoted almost exclusively to the presentation and discussion of papers on industrial relations. The sectional meetings, of which there were 32, were divided into 19 groups.

The first general session devoted to the general subject of employees' representation was featured by three addresses, those of Cyrus McCormick, Jr., works manager of the International Harvester Company, Chicago, who spoke on "Co-operation and Industrial Progress"; Mathew Woll, vice-president of the American Federation of Labor, who spoke on "Employees' Representation from the Standpoint of Organized Labor," and W. M. Leiserson, impartial chairman of the Labor Adjustment Board for the clothing industry of Rochester, N. Y., who spoke on "Labor Management and Collective Bargaining."

The first session of the Steam Railroad Section, presided over by R. C. Richards, chairman of the Central Safety Committee, Chicago & North Western, Chicago, was featured by the address of A. F. Duffy, manager of the Safety Section, United States Railroad Administration, who said, in part:

A. F. Duffy on Work of Safety Section

Safety is basic in any business where physical hazard is involved, for if you will look about you, I venture you will perceive that the best railroad is the safest railroad and the most efficiently and satisfactorily operated from the standpoint of the people, the government, the owners of the property, and last but very important, the men who work on that railroad and who have it in their hands to make it a successful organization or a mediocre enterprise.

I have been a practical railroad man during all of my working life, and I predict, without qualification, that when once the railroad men of this country thoroughly understand what safety work we are endeavoring to do, why it is necessary, and what are the possibilities they will take hold of this subject in such a manner as to accomplish results which will startle the railroad fraternity.

Safety on railroads has been advanced many years by virtue of the recognition which has been given it by the United States Railroad Administration, and I believe its permanency is already assured; it has demonstrated its capabilities and is now at the crucial time when a realization of its fullest possibilities is all but at hand.

I give it as my unbiased opinion that railroads—like many other industrial organizations—have not, up to a comparatively recent time, given due consideration to the human factor in industry by recognizing the fact that men and women are infinitely more important than machines, structures, or appliances of any description. When we contrast the degree of care which is exercised in the purpose, use, and maintenance of locomotives with the employment, service, and training of the average employee of the average railroad we are disappointed to learn the inequality which exists as between the machine, which can be replaced with money, and the life, which is absolutely irreplaceable, and which, when once gone, can never be brought back.

Some of us are disposed to be altogether too conservative and reactionary in the activities we employ in conducting this work, and sometimes we are apt to underestimate the value which comes from the financial expenditure required to carry it on. I do not subscribe to the theory that within

intelligent and reasonable limitations it is possible to become overzealous or to overdo in a matter of this kind. We must, from the very nature of the work, consistently and continuously develop new plans and methods for creating and sustaining the interest of railroad employees, and of all persons subject, directly or indirectly, to the hazard of railroad operation. It is just as good business, if we must for the moment regard the matter from a monetary standpoint, to expend money for safety activities as it is to make investments for approved devices which will conserve fuel, increase car loading, improve efficiency, or reduce maintenance cost. It is a great deal more important, and, as a rule, will pay materially larger returns.

In deliberating these matters, however, I urge you not to lose sight of the fact that the aim and purpose of the work of the Safety Section is not to save money, but always has been and always will be to conserve human life and limb. If any saving of money is made by reason of a reduction in casualties surely that result is not subject to criticism, for in order to save money we must first avoid the casualties themselves.

The recognition of the human element, then, is the most important factor in railroad service, and its training and education in safety is the foundation upon which are built the aims and purposes of the Safety Section. And, since the whole scheme of things revolves around the safety committee organizations it is to this phase of our work that the greatest attention must be given. There is no more honorable position today on a railroad than that of safety committeeman. His is a real service to mankind, and he can be proud of that service, if he is doing all that may reasonably be expected of him. If he is not measuring up to his responsibilities it is probably because he has not been properly instructed and trained in his work. Our safety committee meetings must be so regulated that the members thereof will be not merely interested in their work, but enthusiastic about it. To this end it is essential that safety officers or their assistants attend committee meetings frequently in order to insure their proper functioning and to sustain the interest which is so necessary on the part of safety committeemen.

A fact which is of prime importance in the relation of safety to railroad operation, is that when experienced men are taken out of the service because of casualties the employment of new or inexperienced men in their stead not infrequently causes additional casualties to occur, because of the lack of familiarity with the work in hand; and always such a situation decreases efficiency and output, and otherwise costs money and causes hardships. This fact emphasizes too the real necessity for constructive thought and action in relation to the safety education, and training of the new man in the service, and of the employee who is promoted or changed from his customary occupation to one with which he may not be familiar.

Another of the aims and purposes of the Safety Section is to secure liberal publicity of the work we are doing and the necessity for it; of the altogether too large number of railroad men who are killed and injured every year in the business of operating the railroads of this country; of the appalling number of people who are killed and injured each year while wrongfully trespassing on railroad premises, and of the alarmingly increasing number of people who meet death and injury while passing over highway crissings.

Concretely, this publicity in the case of employees should be in the form of bulletins, posters, pamphlets, casualty statements, and such other data and information as may be deemed advisable. We must never lose sight of the fact that safety is fundamentally a work of the employees who do the physical tasks incident to railroad operation. They are almost entirely responsible for the accomplishments heretofore made in this great movement and will be the strength and power for good which will come in the future.

The railroad men of America have responded nobly to the activities of the Safety Section of the United States Railroad Administration. But if we expect them to continue in their interest and enthusiasm it will not suffice simply to beseech them to stop deaths and injuries. It will be necessary to keep them constantly informed as to the number of casualties which occur, what causes them, and what may be done to prevent a repetition of similar casualties. The data, so far as is practicable, should be prepared in some competitive form so that rivalry will be created between the various units of the railroad.

In the case of trespassing and highway-crossing accidents, it has seemed to me for some time that we have not applied ourselves to this vital question with deserved attention. We are too prone to take for granted that nothing can be done to check these evils. Consistent publicity, posters, and the medium of public and parochial schools, automobile clubs, and commercial associations, village, city, county, and state officials represent available avenues of approach in this matter.

It is but natural that certain developments during the past year should stand out preëminently as auguring well for the future of safety. One of these developments is the truly remarkable interest which has been manifested in safety by railroad men, as evidenced by the endorsements of the work of the Safety Section in the national conventions of the Brotherhood of Locomotive Firemen and Enginemen; Brotherhood of Railroad Trainmen; Switchmen's Union of North America; Order of Railway Conductors; Order of Railroad Telegraphers; Order of Railroad Station Agents; Brotherhood of Railway Clerks, Freight Handlers, and Station and Express Employees; Brotherhood of Maintenance of Way Employees; with a total membership of 1,182,000 railroad men and women.

Another development of significance is the universal approval of the safety committee organization and the entire plan for conducting this work as promulgated by the Safety Section. It is encouraging thus to observe as we go along that we are on the right track, and because we are right we are bound to achieve the goal of all safety men, whereby the lives and limbs of men, women, and children will be saved from railroad casualties, so far as it is humanly possible so to do.

M. A. Dow, general safety agent, New York Central, New York City, addressed the meeting on the "Value and Necessity of Safety Agents" and R. H. Doolittle, supervisor of safety, Colorado Southern, Denver, Colo., spoke on the co-operation of employees and officers in safety work on railroads.

A Big Improvement

The second session of the Steam Railroad Section was addressed by W. G. Lee, president of the Brotherhood of Railway Trainmen; T. H. Carrow, supervisor of safety, Pennsylvania Railroad, Philadelphia, Pa., and Robert Scott superintendent of insurance and Safety, Atlantic Coast Line, Wilmington, N. C.

Mr. Lee said in part:

No class of people can be more vitally interested in the progress of the safety movement than the trainmen. It is wholly due to the progress of the safety first idea that accidents and subsequent expenditure of money for death and disability claims has been lessened during the past year.

Additional promotion of care and safety propaganda and use of new safety appliances can lessen this loss in life and efficiency to a still more appreciable degree.

Approximately $4,000,000 was paid out in 1918 for death and disability claims in the railroad industry. So far in 1919 this figure has fallen below the three million

mark. This is due entirely to the safety movement, in my opinion.

Let's talk safety, plan safety, and above all, practice safety.

Study the Human Factor

Mr. Carrow presented a general outline of the salient features of safety committee work and methods of treating and disposing of suggestions and recommendations made to eliminate unsafe practices and conditions.

Mr. Scott said in part:

Safeguarding and education represent the essential elements of any safety organization, which naturally requires efficient planning, direction and supervision.

I have observed a tendency on the part of safety committeemen to confine their attention to the obvious mechanical and structural conditions, which should have been remedied by the foremen or supervisors, instead of studying the broader and more productive field of dangerous practices. In other words, there is always a tendency to superficial inspection which is difficult to overcome.

After selecting as head of the organization a man who has an abiding faith in the necessity for the work, it is apparent that next in importance is to place upon the committees only such men as are believed would prove loyal to the cause and can grasp the real meaning of safety, i. e., that it deals with human nature and human relations more than with structural or mechanical conditions. It is believed that if safety committeemen are of the type mentioned in the foregoing paragraph, they will create an atmosphere of intolerance, of careless and reckless habits in the territory in which they work. Not only will they be active aids to the safety department, but they will serve in various ways as the connecting link between the management and the rank and file men—between staff and labor. These are the men who will come to the assistance of the management in time of stress; who will come forward with information beyond the officials' vision, and who, in countless ways, will promote the unity of the entire organization.

The general safety committees should be composed of general and division officers, chosen in such a manner that the different departments of service shall be represented on that committee. The chief operating officer usually acts as chairman. It is desirable that this committee shall have general supervision of the safety organization.

A division safety committee, composed of division officers, with the superintendent as chairman, and one or more representatives of each of the different classes of service, should be formed and can be of much assistance to the general committee provided it has the proper conception of its functions, and will with intelligence and zeal seek to perform these functions.

At all shops employing more than several hundred men a safety committee composed of the principal officers of the shop, with the ranking officer as chairman, and one or more representatives of each of the different classes of service, should be formed. If the shop is under the jurisdiction of the division superintendent, the committee should report to the division safety committee, otherwise to the general safety committee. Too much care cannot be exercised in the selection of men to serve upon shop committees because of the necessity for having intelligent and enthusiastic committeemen who will take it upon themselves to instruct and advise new employees or older ones who are not inclined to follow safe methods in the performance of their work.

At each large terminal a safety committee should be formed, compose d of the officers in charge, with the superintendent or ranking officer as chairman and one or more representatives of each of the different classes of service. If the terminal is under the jurisdiction of the division superintendent, the committee should report to the division safety committee, otherwise to the general safety committee.

Where conditions require, local committees may be organized in yards, roundhouses, smaller shops, large freight houses, etc.

No accident prevention work can be successfully carried on without the hearty support of executive and supervising officers. As the first and essential step, then, in inaugurating a safety educational movement, should be a clear, unequivocal statement by the management as to where it stands.

To properly maintain interest in safety among the officers it is necessary that the man in charge of the work of accident prevention must be possessed of a compelling personality and that he will with diplomacy, tact, and perseverance keep the subject of safety ever before these officers, and present to them such interesting facts as will not only command attention but will actually cause them to become and remain deeply interested in it.

After having aroused the interest of employees, a more difficult problem arises as to how this interest can be held. I am convinced this cannot be done by following any one scheme, but can only be successfully accomplished by the employment of a combination of methods.

Among the things that have been used with the greatest success is the motion picture car, accompanied by a lecturer, on account of the benefit that accrues from placing the importance of safety before employees and their families, also in enlisting their interest and support in accident prevention. Carelessness has slain, crippled, and blinded more men, has made more widows and orphans, has left on the face of this earth more hands outstretched for charity than all the great wars or other calamities that have befallen mankind. Let us fight it with all the intelligence we are capable of developing and with the full strength of our manhood to the end that the world will be a better place for our having lived in it.

At the third session of The Steam Railroad Section, G. L. La Fountaine, general safety supervisor of the Great Northern at St. Paul, Minn., presented a paper on the "Importance of Proper Inspection of Tools Used in Shops and by Maintenance of Way Gangs" and J. L. Walsh, superintendent of safety of the Missouri, Kansas & Texas of Texas at Dallas, Tex., spoke on motor and hand car accidents. In addition a discussion was held on the causes and remedies for accidents in train service.

Mr. La Fountaine said in part:

For the purpose of formulating a definite plan of inspection, all hand tools used in shops and engine houses may be roughly divided into two classes—those which are circuated in general use and those which are regularly assigned to individual workmen.

In connection with the first class, I would suggest that every shop or engine house employing any considerable number of workmen maintain a tool room in which all hand tools of general use be assembled at the close of the day's work. A competent man should be placed in charge of this room with the care and inspection of those tools as his sole duty; he should maintain his stock in a good, serviceable condition at all times, and any tools worn to any appreciable degree, such as a chisel with a burred or mushroomed head or a wrench with rounded jaws, the further use of which invites one of these minor accidents, should be repaired or replaced at once. It should be impressed upon this man that the primary purpose of his being employed is in the interest of accident prevention, and that the responsibility for any accident resulting from the use of a worn or defective tool which left the tool room in that condition must lie directly with him.

In respect to those tools regularly assigned to shop employees, we encountered our greatest difficulties. These tools are kept in private lockers, and in a great many cases are subject to no other inspection but that of the employee him-

self. You will find as a rule, although he is known to be a conscientious and thoroughly dependable workman, that his tools have been gathered during a long period of selection and he regards them with not a little pride resenting inspection which may question their further serviceability. We must have frequent inspections. Since the majority of workmen cannot be relied upon to inspect their own tools, that duty must devolve upon the shop foreman.

To my mind, the foreman can make the most effective inspection of tools while they are in actual use because of the opportunity this affords him tactfully to demonstrate and explain the elements of danger in the imperfection, thereby teaching the employe by example, as well as precept, which will leave a lasting and favorable impression.

The inspection by the foreman might well be supplemented by a competent safety committee, such as now exists in practically all well-organized shops. Imbued with the proper spirit, the members of the committee can make frequent inspections of their fellow-worker's tools with their own daily experiences as a guide.

The importance of keeping the tools used by the maintenance of way gangs in good, serviceable condition is just as essential as that of every other department upon the railroad, and what I have said in connection with the method of inspecting tools assigned to individual workmen in the shops, will serve equally well with the maintenance of way gangs. The foreman of the gang should inspect the tools daily and know that they are in first class condition before permitting the employees to use them, and should be held strictly responsible for all accidents resulting directly from the use of worn or defective tools.

This inspection by the foreman should be especially severe during those seasons of the year when "new" men are added to his gang. Many of these men are absolutely inexperienced in the use of tools of any kind, and defective tools in their hands are a cause of far greater concern than such tools would be if their use were confined to experienced men.

Not only is such inspection an absolute necessity in the interest of safety, but they all should contribute much toward economy and efficiency. A well conducted method of tool inspection serves a double purpose: safety and efficiency, the two great factors of modern industry, which go hand in hand. If a tool is to do the work it was originally designed to do, it must be kept in its original entirety. The more it lapses from that state, the less efficient and more dangerous it becomes.

Motor and Hand Car Accidents

Mr. Walsh said, in part:

When efforts are made to reduce the number of hand and motor car accidents, the first consideration is usually given to the rate of speed at which cars are operated. When accidents occur, the speed of the car is not usually the primary cause of the accident. While division inspection cars might be operated safely at 20 or 25 miles per hour between stations on straight track, I think the general rule for section and B & B cars should provide a maximum speed of 15 miles per hour between stations and a maximum of 10 miles per hour over road crossings, over frogs and switches, in cuts, on curves, and during foggy weather.

Railroads adopting the motor car as standard for the maintenance of way department, and others having occasion to use them, should organize a motor car department, in charge of experts to keep the cars in repair, to make frequent inspections and adjustments from time to time, and to educate the employees using the car in its proper maintenance and safe operation. The expense of such a department should be offset by less delays and greater efficiency in cars in use.

On some railroads it has been the practice in the past to allow foremen to purchase their own motor car or gasoline engine with their personal funds, and in the latter case, a foreman usually fits the engine to a dismantled hand or push car, and creates a home-made motor car. This practice I think should be prohibited, as it is wrong in principle to require the employees to purchase their cars, and it leads to bad practices on the part of the foremen in many cases.

In addition hand and push cars are not constructed sufficiently strong to stand up well in service under the strain and pounding to which they are subjected when equipped with gasoline engines. These home-made motor cars in many cases are not properly equipped with the necessary safety devices, such as seats, guard or hand rails on the front of the car, toe boards, and proper hand brakes.

Cars I think should be of the direct-connected type, two-cylinder engine with its few parts to get out of order and adjustment. If possible to attach a speed governor restricting the speed to a maximum of 15 miles per hour to these cars, one that cannot be easily disconnected or tampered with, one that is simple and will not cause engine trouble, I would suggest that all cars for general use be so equipped. There should be a curved hand rail or guard extending to the floor on front of car, and also a toe board to prevent tools and material from bouncing off and derailing it. The wheels should not be more than 16 in. in height, and the floor of the car should be extended flush with the outer edge of the wheels to prevent men getting their feet under the wheels in attempting to board the car from the side. Last but not least, each car should be fitted with a positive acting, effective hand brake.

The surest method of keeping hand and motor car accidents to a minimum after adopting a practical, properly-equipped car as standard, best suited for the purpose intended, is I think, to promulgate a practical set of rules covering their inspection, maintenance, and operation, and see that they are strictly complied with.

Election of Officers

R. C. Richards, chairman of the Steam Railroad Section for the past year, was elected president of the National Safety Council to succeed David Van Schaack, and Fred Meyers superintendent of safety at the Wabash, St. Louis, Mo., was elected chairman of the Railroad Section succeeding Mr. Richards. Robert Scott, superintendent of insurance and safety of the Atlantic Coast Lines at Wilmington, N. C., was elected vice-chairman and H. M. Mayo, superintendent of safety of the Southern Pacific, Tex., was elected secretary of the Steam Railroad Section. Mr. Richards is the first railroadman to be elected president of the National Safety Council. A. F. Duffy, manager of the Safety Section of the United States Railroad Administration, was elected a member of the board of directors and Isaiah Hale, safety superintendent of the Atchison, Topeka & Santa Fe, Topeka, Kan., and R. C. Richards, chairman of the Central Safety Committee, Chicago & North Western at Chicago, were re-elected directors.

An exhibit of safety devices was held at Gray's Armory in connection with the convention and under the joint auspices of the National Safety Council and the Safety Institute of America. Among those who exhibited were the following:

American Abrasive Metals Co., New York City.
Benjamin Electric Manufacturing Co., Chicago.
The Buda Company, Chicago.
Central Electric Co., Chicago.
James B. Clow & Sons, Chicago.
General Electric Co., Schenectady, N. Y.
Norton Company, Worcester, Mass.
Pneumatic Safety Tool Co., Boston, Mass.
John A. Roebling's Sons Co., Cleveland, Ohio.
Safety Nut & Bolt Co., Cleveland, Ohio.
The Trumbull Electric Mfg. Co., New York City.
West Disinfectant Company, New York City.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Penn.
Steam Railroad Section, National Safety Council.
National Safety Council, Chicago.

Report on the Senate Committee's Railroad Bill

Chairman Cummins Discusses Need for Improvement in System of Transportation Regulation

CHAIRMAN A. B. CUMMINS of the Senate Committee on Interstate Commerce, on November 10 submitted a report on the railroad reorganization bill, of which the following is an abstract:

The first thought which the committee desires to impress upon the Senate is the importance of an early consideration of the measure and the establishment of a reasonably permanent status for our systems of transportation. The health, commerce, peace, prosperity, and growth of the United States are absolutely dependent upon adequate and constantly increasing facilities for transportation. Everybody understands that the existing condition is a temporary one; and, as we draw near the end of government operation the demoralizing influences multiply. The conceded return of these properties to their owners, within a short time, necessarily destroys or at least seriously impairs the morale of the operating force and it becomes less and less efficient. A still greater difficulty lies in the fact that no plans can be made for future improvements in the way of additions and betterments, to meet the growing demands of an expanding commerce. Naturally and properly, the Railroad Administration is disinclined to make expenditures of this character involving the execution of a program which, to be effectual, must be consistent and continuous, and the railroad companies are manifestly incapable of either making or carrying out provisions for the enlargement of their facilities for transportation. The result is a practical suspension of work in this direction. There is no practical way in which the period of partial paralysis can be avoided or prevented; but it is obvious, even to the most casual observer, that the period should be shortened by the most diligent attention on the part of Congress.

The bill repeals the act of March 21, 1918, commonly known as the federal control act; continuing it only in so far as is required to close up all matters growing out of federal control. The act takes effect at midnight on the last day of the month in which it becomes a law, and at that time the transfer of the properties in the possession of the government is to occur. All rights and remedies, both of and against the government, are preserved. Without commenting in detail upon what these rights are, it may be said that it will be many years before all the matters growing out of federal control will be adjusted, for the disputes already developed are numerous enough to occupy the attention of the courts for a decade. All that this report will attempt to do, in that respect, is to present an estimate of the uncontroverted condition as it will probably be on the 1st of January, 1920. The estimate has been prepared and furnished to the committee by the financial department of the Railroad Administration; but, as Mr. Sherley, who compiled it, very well indicates, it is only an estimate, for many things may happen before the end of the year to affect it.

To understand fully the financial statement, it is necessary to refer to the federal control act under which the director general of railroads has been operating about 230,000 miles of our 260,000 miles of railways. Whether the President took possession of all the railways at the beginning of the year 1918, is a subject of controversy. It is sufficient to say that the act of March 21, 1918, authorized the President to relinquish at any time prior to July 1, 1918, "control of all or any part of any railroad or system of transportation." About July 1, the President exercised this power and relinquished a large number of the shorter lines, retaining, as already suggested, something like 230,000 miles which had been from the first day of January, 1918, and still are being operated by the director general of railroads.

The federal control act empowered the President to agree with each carrier, whose property was taken over, for the payment of a maximum compensation equivalent to its average annual railway operating income for the three years ending June 30, 1917. Upon this basis the aggregate annual compensation for the use of the railways passing into the hands of the government and retained until the present time is, in round numbers, $900,000,000. At various times the President has entered into contracts with the several railway companies, adopting his maximum authority as the "standard return." With respect to the exact number of contracts so made, the committee is not advised, but it has information to the effect that while in the main the larger systems are under contract there are yet quite two-thirds of the whole number of carriers whose property is being operated by the government which have not signed what is known as the "standard contract." These companies may or may not sign in the future; and, if they do not, each of them will be entitled to recover from the government the just compensation which the law may award. With regard to those carriers, very many in number, which claim that their properties were taken over on January 1, 1918, but which were formally relinquished prior to July 1, 1918, they may or may not be entitled to compensation; and they are mentioned only to say that they are not included in the statement of the existing financial relations between the government and the transportation systems. The director general has made contracts with some of these carriers, but the committee assumes such contracts have not been made under the authority to agree upon compensation but are merely traffic agreements of the general character that one common carrier may lawfully make with another.

The Government's Loss

According to the estimate of the Railroad Administration, the net operating income of the systems in the hands of the government for the two years 1918 and 1919, will be $551,777,459 less than the compensation to which the carriers are entitled, computed as provided in the law and as prescribed in the standard contract; that is to say, when all accounts have been adjusted and paid the government will have lost that amount in its two years of operation. It is the opinion of the committee, without reflecting in any wise upon the Railroad Administration, that in the end the loss will be found to be much greater than the estimate submitted; but, however that may be, it must ultimately be paid from the Treasury of the United States.

As is well known, Congress has appropriated, in all, $1,250,000,000 for the use of the Railroad Administration. This sum, so far as the committee is advised, has been expended, or will be expended, for the purposes and under the conditions prescribed in the federal control act.

Assuming that the government's loss for the two years will be, in round numbers, $600,000,000, it is obvious that if the railways could pay on December 31 all that they owe the government, $650,000,000 of the appropriation would be returned to the Treasury; but that will not be the situation, for it is entirely impossible for the railways to repay out of income the sums which have been advanced by the government for additions and betterments—expenditures which are ordinarily charged to capital account. It will be-

come necessary for the government to pay the railways a large part of the compensation in order that the carriers may pay the interest upon their bonds and other fixed charges and make such distribution in the way of dividends as will prevent undue hardship among their stockholders. If the government retains about $400,000,000 and applies that sum upon the amount due from the railways on account of additions and betterments, the government would still carry about $525,000,000 of the additions and betterments. If, however, it shall carry for future payment all expenditures during the two years for additions and betterments, it must fund nearly $950,000,000 on that account alone. If it is also to carry the amount of cash in the hands of carriers on January 1, 1918, taken over by the government, and the balances in the hands of agents, the amount to be funded would be increased $383,000,000; making a total substantially of $1,300,000,000.

The bill before the Senate pursues a middle course with respect to funding the indebtedness due from the carriers to the government which is thought to be just both to the public and the railways. Nearly three weeks ago the committee asked the Railroad Administration to furnish a statement applying the provisions of the bill to the settlement of accounts and showing just what the result would be; but, up to this time, the statement has not been received.

October 22 the Railroad Administration, through the director of the Division of Finance, sent to the chairman of the committee a letter which presents the basis of the general conclusions above stated. It is in part as follows:

"I beg to give you below a statement showing, on the basis of the best estimate that we can make at this time, an approximation of the amount that would be needed to defray operating deficit, the amount that the Railroad Administration will have temporarily tied up in various assets and the additional amount that will be required in order to aid in the liquidation of the affairs of the Railroad Administration.

The figures are necessarily tentative because the latest balance sheet is for June 30, 1919, and necessarily the most careful estimates can not possibly disclose the precise facts as they would develop during the last six months.

"The figures given are upon the assumption that disposition will be made in accordance with the terms of the standard contract. The other possible disposition suggested in amendments proposed to provide for funding a certain amount of the indebtedness of the railroads would naturally present the matter in a different aspect.

"In order to enable settlements with the railroad companies at December 31, 1919, it will necessitate the payment to them of approximately $326,541,893, arrived at as per the following table:

Accounts with the corporations immediately payable at December 31, 1919.

Due the Government:		
Demand loans		$53,078,186
Short term notes		75,553,167
Open account balances due Government	$220,053,510	
Less amount not now collectible	66,028,228	
		154,025,282
For additions and betterments, other than allocated equipment, financed from income		370,381,494
Allocated equipment financed under general equipment plan		200,000,000
For additions and betterments financed through open account due company		45,100,132
Total immediately payable to Government		$898,138,261
Due the corporations:		
Balance due on compensation		$855,395,851
Depreciation and retirements		304,179,281
Open account balances due corporations		65,105,022
Total immediately payable to corporations		$1,224,680,154
Amount needed to be appropriated to enable the Railroad Administration to immediately pay to the corporations the net amount due them		$326,541,893

"When the Railroad Administration shall have made settlement with the railroad companies in accordance with the foregoing the situation will be as follows: The Railroad Administration will have expended and there will, in consequence, have been correspondingly consumed or tied up—

1.	Amount necessary to defray operating deficit, the difference between the standard rental payable to the railroad companies and the estimated net operating income for the 24 months ended December 31, 1919	$551,777,459
2.	Amount of cash working capital necessary to leave temporarily with the corporations until the returns from the operation of their properties after Federal control become available	357,943,276
3.	Amount of open account due Government by the corporations, representing payments by Government of corporate liabilities which the corporations can not repay at this time	66,028,228
4.	Amount of additions and betterments' expenditures including equipment, made to the railroad companies' properties during 1918 and 1919, which must be carried by the Railroad Administration for the time being	518,075,309
5.	Improvements on inland waterways	14,341,885
6.	Loans during 1918 and 1919 to railroad companies not immediately repayable	48,375,735
7.	Boston & Maine reorganization	20,000,000
	Total	$1,576,541,893

"Appropriations heretofore made and applicable, to the foregoing aggregate $1,250,000,000, so that to discharge its obligations as they exist at December 31, 1919, on the basis of the standard contract, the Railroad Administration will need an additional appropriation, it is estimated at this time, of $326,541,893.

"Concerning the proposal to fund the indebtedness of the railroad companies to the Railroad Administration, it will be noted that a settlement under the contract contemplates that there will have been retained in settlement with the companies, on account of additions and betterments to their properties, the sum of $415,481,626 and that it is contemplated that even with that deduction from the compensation that the government, nevertheless, will be carrying $518,075,309 of additions and betterments which the companies are not able to repay at this time, so that if the whole amount of the indebtedness for additions and betterments should be funded the above appropriation would have to be increased by the amount of $415,481,626 and the government would then be required to fund for additions and betterments the sum of $933,556,935.

"Regarding the proposal of the corporations that the amount of the working capital taken over should also be funded, it is to be observed that at the beginning of federal control the amount of cash in the hands of the treasurers, so taken over by the Railroad Administration, aggregated $239,190,605. In addition, the balances in the hands of agents and conductors aggregated $143,899,424.

"If the proposal looks to the furnishing of these amounts in addition to amounts sufficient to pay off the liabilities of the Railroad Administration, that amount would have to be added to the requirements shown above. However, the fact is that the Railroad Administration used such cash and agents' and conductors' balances in liquidating the liabilities of the corporations in the earlier months of federal control and it is to be assumed that a like process will take place at the end of federal control.

"If, therefore, the Railroad Administration leaves in the hands of the corporations a sufficient amount of working assets to liquidate its liabilities, not all of which must be paid simultaneously with the end of federal control but which will be liquidated doubtless spreading over a period of from 30 to 90 days (it is true that a considerable part of such liabilities must be met in the first 15 days following the return of the roads to private control and a sufficient amount of cash or other quick assets should be left with the corporations to protect them) it would be ample protection to the corporations in point of working capital and would practically duplicate the situation as it developed when federal control intervened.

"As stated above, the Railroad Administration used the cash assets of the corporations, generally, for the payment of the corporations' liabilities. To the extent that there is a balance in the hands of the Railroad Administration, resulting from such trasactions, the statement showing the account with the companies on page 2 of this letter, contemplates that such amount will be paid over to the companies except to the extent that any such amounts may be properly

applied to the repayment of the indebtedness of the companies to the Railroad Administration.

"To the extent that such process resulted in the Railroad Administration paying corporate liabilities in excess of assets, the account on page 2 of this letter contemplates, moreover, the collection thereof from the corporations only in cases where it is practical for such corporations to make payment thereof from balances of compensation due them.

"On this theory, the foregoing indicates that the government will be required to carry, for the time being, balances due from the corporations on open account aggregating $66,000,000.

"With reference to the amount shown above for working capital temporarily tied up, it should be observed that a considerable part of the assets of the Railroad Administration are represented by items other than cash. For example: traffic balances, accounts receivable and various unadjusted items, both debit and credit, that are necessarily incident to a business of such magnitude and which can not finally be cleared up short of several months. The amount shown represents the balance between such unsettled assets and unsettled liabilities—the net being the figure which is shown as the amount which the government will temporarily have tied up as working capital.

"If for any cause the plan for a general equipment trust should not be carried out, there will be needed a sum greater than has been set up. How much, it is now impossible to foretell. The general equipment trust plan contemplates a repayment to the government of at least $200,000,000 which figure has been used in the foregoing statements. In the absence of a general equipment trust plan, some moneys could be immediately secured through equipment trusts of individual carriers. Perhaps something like $100,000,000 could be obtained in this regard. So that the figure given above, $326,541,893, might need to be increased by $100,000,000.

"I think it is desirable that I again emphasize the fact that this statement, though made from a somewhat detailed examination of accounts with the respective carriers, of necessity can not be considered as final. The need to forecast events more than two months away of itself introduces elements unstable enough to make conclusions necessarily tentative only.

"In addition, there are various matters that will only reach adjustment and a status sufficient to enable them to be stated in financial terms after presentation and determination of claims respectively by the government and the railroads touching many items incident to federal control. So that in particular the item set out under the designation of 'Amount necessary to defray operating deficit, etc., must be considered as subject to considerable change because of the subsequent bringing into it of debits and credits which can not now be even approximated. I am sure that you will appreciate these facts and I emphasize them simply that a cursory statement of the figures therein submitted may not lead others to erroneous conclusions."

The Policy Established by the Bill for Future Control and Regulation

Having made clear, as it is hoped, the terms upon which the railways are to be returned to their owners for private operation under public control and regulation, the committee advances to these parts of the bill which create the permanent system for such control and regulation. In considering this phase of the subject, it should be constantly borne in mind that if our policy is to be private operation of the instrumentalities of transportation there must be a large and constant inflow of capital. As commerce increases in volume, the facilities of transportation must increase; and, without reckoning the funds which must be secured to discharge maturing obligations already in existence, it will be conceded by everybody that immense sums will be required from year to year for new construction, additional equipment, and necessary improvement. The capital thus demanded must be drawn from those who have money to invest, and, of course, it must be voluntarily contributed. If the people who have money will not invest it in the transportation enterprise, private ownership and operation under public control must necessarily fail. It is apparent, therefore, that any legislation which may be proposed upon the hypothesis of private ownership and operation must tender to the future investor reasonable security for the investment he is asked to make and reasonable assurance of such yearly return upon his money as will induce him to enter the field. The better the security and the more certain the return, the less will be the rate required to attract the investment.

It is here that our present system of regulation has failed. Taking the railways as they are, with their widely varying conditions, both of construction and environment, it is wholly impossible for the Interstate Commerce Commission, no matter how wise and faithful its members may be, to prescribe schedules of charges for transportation that will be, at the same time, just to the public and that will maintain the railways which must continue to function if the people of the country are to be provided with adequate transportation. In a given competitive area the rates which will furnish one company a grossly excessive income will lead another into bankruptcy. The writer of this report is firmly convinced that when the government assumed the operation of the railways they were, taken as a whole, earning all they should be permitted to earn; but, in the inevitable distribution of these earnings among the various railway companies, the railways which carried 30 per cent of the traffic were earning so little that they could not, by any economy or good management, sustain themselves. Nevertheless, it is unthinkable that these highways of commerce shall be abandoned, and some system must be devised not only for their continuance but for their betterment and growth. Government ownership would solve the problem, but it is the judgment of the committee that government operation is attended with so many disadvantages—notably in the increased cost of operation—that this plan must be discarded. There is but one other solution. It is consolidation, and here two policies at once present themselves. The first, complete consolidation into one ownership; second, consolidation into comparatively few competitive systems. The first has some advantages over the second, but it has some disadvantages, and the disadvantages outweigh, in the opinion of the committee, the advantages.

The superior efficiency of several systems need not be enumerated at length, but there is one consideration to which attention should be called: Competition, not in rates or charges but in service, will do more to strengthen and make public regulation successful than any other element which can be introduced into the business of transportation. Honorable rivalry among men is the most powerful stimulus known to human effort. For this reason, largely, the committee, recognizing the necessity for consolidation, determined in favor of the gradual unification of the railways into not less than 20 or more than 35 systems; not regional or zone sytems but systems that will preserve substantially existing channels of commerce and full competition in service. In the grouping of the railways into these systems, another vital rule is to be observed; namely, that they are to be so divided that the operating incomes of the several consolidated companies will bear substantially the same relation to the value of their respective properties held for and used in transportation.

The procedure for bringing about the proposed consolidation may now be considered. The bill creates a transportation board, with large duties and powers, which will be more fully explained hereafter. Section 9 declares the policy of consolidation; prescribing that, as soon as practicable and in the manner provided for in the act, the railways of the continental United States shall be divided in ownership and for operation into not less than 20 or more than 35 separate and distinct systems; each of said systems

to be owned and operated by a distinct corporation organized or reorganized under the act. Section 9 concludes:

In the aforesaid division of the said railways into such systems, competition shall be preserved as fully as possible, and wherever practicable the existing routes and channels of trade and commerce shall be maintained. The several systems shall be so arranged that the cost of transportation as between competitive systems and as related to the value of the properties through which the service is rendered shall be the same, so far as practicable, so that these systems can employ uniform rates in the movement of competitive traffic and under efficient management earn substantially the same rate of return upon the value of the railway properties involved in the comparison.

Especial attention is directed to the sentence last quoted, for it expresses the object to be attained; and until it is attained rate regulation can not be fully equitable to both the public and the carriers.

Immediately upon its organization, the transportation board is to prepare and adopt a tentative plan for consolidation. The plan is to be submitted to a public hearing, at which it is assumed that all persons interested will appear. After the hearings are concluded, a final plan is to be adopted and submitted to the Interstate Commerce Commission for its approval. This arrangement will make known to the whole country the consolidations which must eventually occur. Section 12 presents the authority for the reorganization of existing railway corporations, and all consolidations must be either through a reorganized railway corporation or one originally organized under the terms of the act. It is to be noted, also, that if a partial and voluntary consolidation is carried into effect it must be in harmony with and in furtherance of the complete plan established by the board. Sections 21 and 22 provide for the original incorporation of railway companies; and, concerning this part of the bill, it need only be remarked that any such corporation must be organized "for a specific and defined purpose, namely, the ownership, maintenance, and operation of one of the railway systems or for the construction, ownership, maintenance, and operation of new lines or systems into which the railways of the United States are to be divided by the aforesaid board."

For the period of seven years after the act becomes a law, voluntary consolidations are authorized, under the strictest supervision by either the board or the commission. The distinctive feature of the voluntary as well as the involuntary consolidations is that the capitalization is not to exceed the actual value of the property held for or used in the transportation service. When the Interstate Commerce Commission finishes the valuation in which it is engaged and when those values, as they are judicially determined and only those values, pass into the capitalization of the newly organized or reorganized corporations under this act, that serious obstacle in the way of effective regulation will have disappeared.

At the end of seven years the compulsory consolidation begins. It is carried out as provided in section 13. If, during the seven years, voluntary consolidation has accomplished the purpose, this section, of course, will not be operative; but, during the voluntary period, its presence in the law will be a compelling force which, in the judgment of the committee, will stimulate the present railway companies to carry forward the declared policy of Congress.

The full advantages of the proposed policy of consolidation can not be secured for 10 or 12 years. The railways must be returned to their owners at once. This situation makes it necessary to provide a plan for immediate relief that will tend, at least, to overcome the difficulties confronting us and render private operation possible.

A Review of The Plan

In this regard the bill attempts to accomplish three results:

First: By prescribing a basis of return upon the value of the railway property, to give such assurance to investors as will incline them to look with favor upon railway securities; that is to say, by making a moderate return reasonably certain to establish credit for the carriers.

Second. In making the return fairly certain to secure for the public a lower capital charge than would otherwise be necessary.

Third. In requiring some carriers, which under any given body of rates will earn more than a fair return, to pay the excess to the government and in so using this excess that transportation facilities or credit can be furnished to the weaker carriers and thus help to maintain the general system of transportation.

To bring about these results, section 4 requires the Interstate Commerce Commission inmmediately to divide the country into rate districts, having in view the similarity or dissimilarity of transportation and traffic conditions therein and to institute hearings to determine the adequacy of the rates in any such district from the revenue standpoint and considered as a whole. The rule to be applied in passing upon such issues is announced in section 6, wherein it is stated that the rates shall be so adjusted "as nearly as may be so that the railway carriers as a whole allocated to each district and subject to this act shall earn an aggregate annual net railway operating income equal, as nearly as may be, to 5½ per centum upon the aggregate value, as determined in accordance with the provisions hereof, of the railway property of such carriers in the district held for and used in the service of transportation." To this basis the commission is authorized to add, in its discretion, one-half of 1 per cent upon this value as a current contribution to improvements, betterments, or equipment unproductive in character, but which are customarily charged to capital account. This part of the revenue, however, if raised at all, is, in the future, not to be capitalized by any carrier whose net railway operating income for the year is more than the basis adopted; namely, 5½ per cent.

The basis thus established has been the subject of much criticism. On the one hand, it is asserted by the carriers that it is too low and will not enable them to obtain the money which they must have in order to develop their properties and provide further transportation facilities which the country demands. On the other hand, it is asserted, with equal emphasis, by some advocates representing the shippers, that the basis is too high and will give the carriers a greater revenue than they need or ought to have. There were differences of opinion in the committee with respect to the matter, and it is but fair to say that the basis presented is a compromise of these differences. It is believed, however, that both sides of the controversy somewhat exaggerate the facts, or, rather, fail to take into consideration all the facts which influence the subject. In reaching a conclusion, it ought to be borne in mind that the property to which the basis is to be applied is railway property only; that is, the property which renders the service of transportation. All outside investments by railway companies are excluded. Further, in valuing these properties the commission is to be guided by the rules of the law and is not bound by either capitalization or by what is commonly known in the accounting system of the commission as "property investment accounts."

Those who insist so earnestly that the basis will provide insufficient revenue generally ignore the fact that at the present time there are outstanding more than eleven billions of railway bonds which bear an average interest of about 4½ per cent, and on that part of the value of the property the carriers will save 1 per cent. It must also be remembered that the 5½ per cent basis for a rate district will not give to each carrier in that district 5½ per cent upon the value of its property. To some carriers the return will be much higher and to others correspondingly lower. To illustrate: In the test period for ascertaining compensation under the

act of March 21, 1918, the average net annual operating income of the class I railways was 5.2 per cent upon the aggregate property investment account. There are, however, wide differences when the individual carriers are considered. Under this average, the New York Central System earned 6.09; the Pennsylvania Co., 6.25; the Pennsylvania Railroad, 5.36; the Delaware & Lackawanna, 7.54; the Erie, 3.56; the Baltimore & Ohio, 4.67; the Chicago, Burlington & Quincy, 7.02; the Chicago & North Western, 6.13; the Missouri Pacific, 4.43; the Union Pacific, 6.72; the Southern Pacific, 4.99; the Northern Pacific, 6.27; the Great Northern, 6.70; Atchison, Topeka & Santa Fe, 6.16; Chicago, Milwaukee & St. Paul, 4.71; Chicago, Rock Island & Pacific, 4.72; Chicago Great Western, 1.77; Chicago & Alton, 2.64; Western Pacific, 2.28; Colorado Southern, 3.04; Missouri, Kansas & Texas, 2.81; Texas Pacific, 3.76; Wabash, 2.91; Western Maryland, 2.58; New York, New Haven & Hartford, 5.96; Boston & Maine, 4.80; Cincinnati, Hamilton & Dayton, 1.95; Atlantic Coast Line, 5.76; Seaboard Air Line, 3.68; Southern Railway, 4.12; Louisville & Nashville, 6.32; Illinois Central, 5.48.

The basis adopted by the committee is three-tenths of 1 per cent higher than the basis of the test period; and, assuming, though not conceding, that the value of the property is equal to the aggregate of the property investment accounts, it will yield for all the railways a net operating income of $54,000,000 in excess of the income of the test period.

There were two considerations which led the majority of the committee to believe that this increase is not only warranted but necessary:

First. The railways are being returned to their owners when everything is unsettled and abnormal; when there is suspicion and distrust everywhere. Just what rate of return will enable the carriers to finance themselves under such conditions can not, with certainty, be determined. It was, therefore, felt that some increase over the pre-war period is justifiable.

Second. As compared with all kinds of commodities, money is much less valuable than it was a few years ago, and it would seem to be only fair that the returns from railway investments should be reasonably advanced.

The committee, however, recognized that the present situation may be temporary, and that in the course of time the country may be restored to something like its former circumstances, and it provided for this very probable change in the last paragraph of section 6, as follows:

> That in the year 1925 and in every fifth year thereafter the commission shall determine what, under the conditions then existing, constitutes a fair return upon the value of such railway property, and it may increase or decrease the 5½ per centum basis herein prescribed, or the basis for the determination of excess income.

These are the reasons, in chief and in brief, which convinced the committee that the 5½ per cent basis for computing the annual operating income of the carriers is fair and just, both to the public and the railway corporations.

It is obvious that if the law gives to the carriers the assurance of income heretofore mentioned there should be a maximum beyond which an individual carrier shall not be permitted to retain for its own use all it may receive under a given body of rates. Referring to the illustrations already given, it is seen that with uniform rates, and they must be uniform in competitive territories, one carrier will receive an operating income of 2 per cent, another 4 per cent, another 6 per cent, another 8 per cent, and others still more. The bill fixes a standard of excess income and requires the carriers which receive an excess income (which will hereafter be explained in detail) to pay the excess to the transportation board for uses that have been mentioned and which will be more fully stated in a subsequent paragraph of this report.

Upon this requirement there has been a long-continued and earnest controversy before the committee. It has been contended by eminent lawyers that the provision is unconstitutional in that it takes property without compensation. It has been urged by equally eminent lawyers, and probably more of them, that it is not only constitutional but absolutely necessary if private ownership and operation are to be continued. It would unduly prolong this report to enter upon a review of the authorities or an argument which would embrace all the considerations which are material to the question. It is sufficient to say that a large majority of the members of the committee entertain no doubt with respect to the authority of Congress in establishing this policy. Heretofore the regulation of transportation has been regarded merely as a restriction imposed upon particular carriers. For the first time it is proposed to look upon transportation as a subject of national concern and from a national standpoint. It is the duty of the government so to exercise its power of regulating commerce among the states and with foreign nations that all parts of a common country shall enjoy adequate transportation facilities at the lowest cost consistent with fairness to the capital invested and to the men who manage and operate these facilities. The commerce of one community, in these days, is deeply involved in the commerce of every community in the land. All the railways we have, or substantially all, must be maintained; and, from time to time, they must be enlarged and additional facilities must be provided.

If the lawyers who insist that taking excess income is unconstitutional are right in their premises, their conclusion would be unassailable. They assume that all the earnings of a given railway under a prescribed body of rates become the absolute property of the carrier which receives them. This is not true under the system which the bill creates; and, therefore, the conclusion is unsound. If there were but one railway in the country, it would be entirely possible for the regulating commission to fix rates for it under which it could not earn more than 6 or 7 per cent upon the value of its property, but we have a thousand railways; and rates for transportation must be fixed with reference to all of them and to the needs of the people to whom all of them render their service. These conditions make it utterly impossible to fix rates which are reasonable for one carrier, considered apart from all the remainder. It is, therefore, in the competence of Congress to declare that the income which any particular carrier receives beyond a fair return upon the value of its property, it receives as a trustee for the public and not as its own absolute property. If this analysis of the power of regulation is not sustained, then the authority granted in the Constitution is a mere delusion.

With reference to excess income, the bill provides that any carrier receiving a net railway-operating income in any year of more than 6 per cent upon the value of its property, one-half of the excess between 6 and 7 per cent is to be placed in a company reserve fund, and the remaining one-half is to be paid to the transportation board. Of any excess above 7 per cent, one-fourth is to be placed in the company reserve fund, and the remaining three-fourths is to be paid to the board. When the reserve fund equals 5 per cent of the value of the railway property and is maintained at that amount, one-third of the excess above 6 per cent is to be at the disposition of the carrier for any proper purpose, and two-thirds is to be paid to the board.

The company reserve fund may be drawn upon by the carrier whenever its annual net railway operating income falls below 6 per cent of the value of its property. The reserve fund is, of course, the absolute property of the carrier; and the purpose in requiring it to be created and maintained is to give stability to the credit of the carrier and enable it to render more efficiently the public service in which it is engaged.

The sums which are to be paid to the transportation board

are to be placed in a general railroad contingent fund, which is to be used by the board, together with all its accretions, "in furtherance of the public interest in railway transportation," "in avoiding congestions, interruptions, or hindrances to the railway service of the United States," or "in furthering the public service rendered by them (carriers), either by way of purchase, lease, or rental of transportation equipment and facilities to be used by such carriers whenever the public interest may require, or by way of loans to such carriers, upon such fair and reasonable terms and conditions, in either case, as the board may prescribe."

The Transportation Board

Section 7 creates a new public authority for the regulation of commerce. Its title is "Transportation Board." It is to be composed of five members, until the consolidation heretofore mentioned is complete and, thereafter, of three members.

The first duty of the board is to prepare and, after hearing, adopt the plan of consolidation. Its general powers with respect to transportation are stated in the latter part of section 10, and these include certain functions now exercised by the Interstate Commerce Commission, among which may be mentioned the following: (*a*) The administration of the car service act; (*b*) of the safety appliance acts; (*c*) of the hours of service act; (*d*) of the locomotive boiler inspection act; and others of like character. It is also charged with a series of important duties relating to water transportation, mainly by way of investigation but leading to most important results. The committee hopes that this part of the bill will be carefully examined, for it is the first real recognition of the coordination of water and land transportation which must eventually be accomplished.

Section 11 confers further powers upon the board. These powers are new to our system of regulation but are considered by the committee as essential. They look toward unification in operation where conditions demand either a diversion of traffic or a common use of facilities.

In section 24 the board is also given control over the issuance of railway securities. It is deemed unnecessary to enlarge upon this subject, because it has been so often before Congress that we are all familiar with it in a general way. The car service act, which is to be administered by the board, is greatly enlarged; and, as now proposed to be amended, will be found in section 34. The thirteenth paragraph of section 6 of the act to regulate commerce is amended in important particulars, and the administration of that paragraph is given to the board.

Section 45, an entirely new regulation, which is intended to increase our export and coastwise trade by making it easier for the interior shipper to avail himself of the ocean routes, is to be administered by the board.

Having thus indicated the chief duties and powers of the transportation board under the bill, it may be helpful to state some of the reasons which led the committee to the conclusion that it is wise to create this additional tribunal in our regulatory system instead of committing to the Interstate Commerce Commission all the new duties and leaving with it all its present duties.

Every member of the Senate knows that the Interstate Commerce Commission is the most overworked body of men in the government; its members are able and industrious, and they labor continuously from the beginning to the end of the year. Nevertheless, they can not keep pace with the demands already made upon them, and, oftentimes, justice delayed is justice denied. The bill the committee has presented increases tremendously the work which some body of men must do if its provisions are promptly carried into effect. It was apparent to the committee that it must adopt one of two alternatives: It must either recommend a very considerable enlargement of the commission, with such division into sections as would permit independent action; or it must recommend the creation of a distinct body. It chose the latter alternative. In determining the division of work, power, and responsibility as between the two bodies, the committee has traced a clear, obvious line. It has not been able, always, to observe the exact distinction; but, in the main, it has succeeded in doing so.

The bill leaves with the Interstate Commerce Commission the quasi-judicial powers; that is to say, everything pertaining to rates and rate-making will be as heretofore, in the hands of the commission. The valuation of railway property, under the act of 1913, remains with the commission. The accounting or reporting system is to be conducted by the commission as inseparable from rate making. There are many other and most important duties to be performed by the commission, so many, indeed, that the committee has some doubt whether it will be able to do its work promptly. These, however, need not be specified, as a reading of the bill and a familiarity with the existing law will disclose them. The transportation board is given, chiefly, the powers which are more nearly and directly connected with the physical operation of the railways and the issuance of securities, power over the things tending for safety, both to employees and the public. It is believed that the division of powers and duties has been so adjusted that opportunity for conflict or discord is practically excluded. It may be here remarked that one of the most vital powers given to the board relates to the settlement or adjudication of disputes between railway employers and employees; but this part of the bill deserves separate consideration and to that subject the committee now invites your attention.

Labor Provisions

It is not necessary to enter upon the details of the establishment of the tribunals created for the adjudication of demands, disputes and controversies which may arise from time to time between railway corporations and railway employees. These provisions will be found in sections 25, 26, 27, and 28 of the bill. It is sufficient to say that there are to be appointed three regional boards of adjustment and a committee of wages and working conditions. These four tribunals, made up in each instance of an equal number of men nominated by railway crafts and railway corporations, have original jurisdiction of all complaints, demands, disputes, and controversies between employers and employees which are not adjusted or settled between the parties themselves. In the event of the failure of these boards of adjustment or the committee of wages and working conditions to reach a decision, the transportation board has final authority; and, indeed, all decisions of these boards or the committee must be approved by the transportation board. It is intended in these sections to bring into existence governmental tribunals so composed that, in so far as mortal man can do justice, there will be complete, impartial justice done to both railway corporations and railway employees and to the public as well.

Hitherto, the government has not undertaken to adjudge the disputes which have so disturbed the field of transportation and which promise to be still more serious in the future than they have been in the past. All that legislation has done up to this time has been to authorize mediation and conciliation and to present an opportunity for voluntary arbitration. After the most careful consideration, it is the judgment of the committee that the time has come to make another advance in the settlement of disputes likely to end in the suspension or restraint of transportation. This forward step must be clearly understood in order to be justly considered. In a controversy between railway workers and railways managers with respect to wages and working conditions and which could only be settled by agreement between the disputants, the right to strike, that is, a concerted cessation of work, seems inevitable; for it is the

only weapon which the workers could effectually employ. A proposal to prohibit an agreement among workers to quit their employment at a given time without substituting some other instrumentality for securing justice would not receive at the hands of Congress a moment's consideration. In making the strike unlawful, it is obvious that there must be something given to the workers in exchange for it. The thing substituted for the strike should be more certain in attaining justice and should do what the strike can not do; namely, protect the great masses of the people who are not directly involved in the controversy. The committee has substituted for the strike the justice which will be administered by the tribunals created in the bill for adjudging disputes which may hereafter arise.

From the public standpoint and in the interest of the people generally, it has become perfectly clear that, in transportation, at least, both the strike and the lockout must cease. This country has been so developed, its population is so situated, its commerce so crystallized that regularity and continuity in transportation have become absolutely indispensable to the lives and health of the people and the existence of our industrial and commercial welfare. A general suspension in the movement of traffic for a fortnight would starve or freeze, or both, a very large number of men, women, and children; and, if it were continued a month or two months, it would practically destroy half our population. Our business affairs would be so disordered that the loss would be greater than in any conceivable war in which we might engage. It is just as much the function of the government in these circumstances to see to it that transportation is adequate, continuous, and regular as it is to maintain order, punish crime and render justice in any other field of human activity. It is clear, therefore, that the government must settle the controversies between railway managers and railway employees which, if left to be fought out between the parties themselves, will lead to the consequences just described. There is but one way in which this can be done: The government must undertake to declare, in any such case, what is justice, what is fair and right, between the parties to the dispute, and then there must be no concerted rebellion or conspiracy among those whose rights have been adjudged for the purpose of coercing either of the parties to the dispute into another and different settlement.

The railway unions are especially opposed to these provisions of the bill, and the committee addresses a word directly to them. In the step the committee has taken there is no hostility to unionized labor; no opposition to collective bargaining. Indeed, the unions and collective bargaining are necessary parts of the plan suggested in the bill. The unions can be more effective in securing justice under the proposed arrangement than they ever have been through the strike, for after all, even the most zealous of the union leaders must admit that their efforts through the strike, from their own standpoint, have substantially failed. The existing complaints with respect to wages and working conditions must be sufficient evidence to these leaders that they have not been able to attain their objects in the old way. Why not, then, exchange the instrumentality which they are now insisting upon and which can be tolerated no longer in a free country, for a better one; namely the justice of an impartial governmental adjudication? The committee is aware that the union leaders feel that they can not hope for justice from the government, but in the opinion of the committee this distrust has no foundation and ought to give way to confidence and hope. If we can not organize tribunals which will do justice to employees, employers, and to the public in a business which so vitally affects the welfare of the nation, then the government is a complete failure and free institutions must be abandoned as an unsuccessful experiment. The committee believes that, when the heat of the immediate conflict over this legislation has subsided, a great majority of the railway workers will hail the substitution of intelligent and impartial tribunals, which will render justice to them, for the right to enter into an agreement or combination to destroy transportation as a deliverance; and as a better way to secure what rightly belongs to them than the methods which they have heretofore employed.

The committee has now reviewed those parts of the bill which propose legislation along lines distinct from those which have been already attempted. There are, in the bill, many amendments of the act to regulate commerce remedying defects which have been disclosed in the administration of the present law; but it is believed that these corrections need not be specifically enumerated in this report. When the bill is presented in debate, all these matters will be carefully explained.

It is but fair to say that this report has not been considered by the committee. It is the work of the chairman, and he alone must be held responsible for it.

Ripley Becomes Chairman and Storey President of the Sante Fe

EDWARD P. RIPLEY, president of the Atchison, Topeka & Santa Fe Railway Company, has been elected chairman of the Board of Directors, effective January 1, 1920. He will be succeeded as president by William B. Storey, Jr., federal manager of the Atchison, Topeka & Santa Fe; the Panhandle & Santa Fe; the Rio Grande, El Paso & Santa Fe; the Kansas Southwestern; the Grand Canyon; the Atchison Union Depot & Railroad and the Pueblo Union Depot & Railroad. Prior to government control of the railroads Mr. Storey was vice-president in charge of construction and operation, with headquarters at Chicago,

Edward P. Ripley William B. Storey, Jr.

Ill., and his election to the presidency follows the policy of the Santa Fe in filling higher positions from its own staff.

Mr. Ripley has been president of the Atchison, Topeka & San Fe Railway Company since the reorganization of the road went into effect on January 1, 1896. Mr. Storey has been vice-president in charge of construction and operation of the Santa Fe System for the past nine years, excepting during his service as federal manager.

For the *Railway Age* at this time to publish a long sketch of Mr. Ripley's railroad career would be a work of supererogation. For many years his career has been followed with keen interest by railway men of all ranks throughout the country. On October 30, 1915, three hundred men, who included the leading railway and business men of the United

States, attended a dinner in Chicago to do him honor on his seventieth birthday. In the issue of the *Railway Age* for November 5, 1915, were published the addresses made on that occasion, which thoroughly reviewed and appraised Mr. Ripley's work.

If he had continued to be president of the Santa Fe until January 1, 1920, he would have filled that office for 24 years, and his record throughout that period has been one of constantly increasing reputation and achievement. When he became president of the Santa Fe it had just emerged from bankruptcy. At the time of his retirement from the presidency the road is universally recognized as one of the best physically, and soundest financially, in the world, besides having a reputation for rendering service of the highest order. Nobody will question that to Mr. Ripley's foresight and ability the creation of the Santa Fe System of today is chiefly due. While he is retiring from the presidency of the company he is taking the chairmanship and this means that when the railway is returned to private control he will continue to play a very important part in its management, although of course Mr. Storey will become its executive head.

Mr. Ripley was born at Dorchester, Mass., on October 30, 1845, and entered railway service in 1868 as contracting agent for the Star Union Line, with headquarters at Boston, Mass. On October 1, 1870, he entered the service of the Chicago, Burlington & Quincy as a clerk in the office of the general eastern agent, with offices at Boston. From 1872 to 1875 he was New England agent for the same road with the same headquarters, and from 1875 to 1878 he was general eastern agent, and on June 15 of the latter year was appointed general freight agent. In 1887 he was promoted to traffic manager and in 1888 to general manager of the same road. In August, 1890, he was elected third vice-president of the Chicago, Milwaukee & St. Paul, which position he held until his election to the presidency of the Santa Fe. Under Mr. Ripley's administration the system's mileage has increased from a total of 6,435 miles to 10,732 miles.

When Mr. Ripley was elected to the presidency, among his first undertakings was the sale and abandonment of some lines not considered desirable, which had been owned and operated by the old railroad company. In accordance with the widely entertained theory of over-construction, Mr. Ripley engineered the sale of the interests owned by the Santa Fe in the St. Louis & San Francisco Railroad Company; the sale to David R. Francis and John Scullin, of St. Louis, Mo., of the St. Louis, Kansas City & Colorado Railway, a line extending west of St. Louis to Union, Mo., and the exchange of the Sonora Railway for the Mojave division of the Southern Pacific. One of the earliest moves made by Mr. Ripley was to call on the chief engineer of the system, the late James Dun, to report on the shortest practicable line between Chicago and Los Angeles, Cal. Under Mr. Dun's survey the line has since been constructed.

Mr. Storey was born at San Francisco, Cal., on November 17, 1857, and graduated from the University of California in 1881. Prior to his graduation from college, Mr. Storey in 1877 served as an axman on the Southern Pacific for one year. After completing his college course he re-entered railway service in 1881 as a rodman on the Southern Pacific and was later levelman, transitman and assistant engineer. From 1893 to 1895, he was assistant engineer with the United States Hydraulic Mining Commission. In the latter year he was appointed chief engineer and general superintendent of the San Francisco & San Joquin Valley, in which position he remained until 1900, when he was appointed chief engineer of the Santa Fe System as above noted.

Mr. Storey, as federal manager of the railway, has been its chief executive officer since government control was adopted. He has long been regarded as Mr. Ripley's logical successor. He happily combines the technical training and experience of the engineer with the experience and outlook of the operating officer and executive. His election as president makes practically certain that there will be no radical change in the organization of the Santa Fe, of which he has been an important part, and the Santa Fe organization has long been recognized as one of the best in the railroad world.

88.4 Per Cent of Trains on Time

AN AVERAGE of 88.4 per cent of all passenger trains on Class 1 roads under federal control made on-time runs during October, or, if late at initial terminals on account of waiting for connecting trains, made as good as schedule time or better, according to a statement issued by the Railroad Administration. This is a slight improvement over the figure for September, 88.1 per cent, and for August, 87.3 per cent.

Of the trains which left their initial terminals on time, and which arrived at their destination on time, the percentage was 84.2, as compared with 84.3 per cent in September and 83 per cent in August.

The Pocahontas region, with 8,923 passenger trains, put 8,262, or 92.6 per cent, over the road in as good as schedule time or better, while at the larger regions the Allegheny region operated 70,882 of its 77,480 trains, or 91.5 per cent, in as good as schedule time or better.

Suburban trains are not included in the compilation.

Following are the figures showing the passenger train performance in the various regions, as compared with September and August:

Region	Month	No. of roads	Total Trains Operated	Trains which arrived on schedule time: Number	Trains which arrived on schedule time: % of total trains	Trains which arrived on Schedule time or which if late made run in schedule time or less: Number	Trains which arrived on Schedule time or which if late made run in schedule time or less: % of total trains
Eastern	October	43	93,979	82,076	87.3	84,878	90.3
	September	43	95,972	80,985	84.4	83,598	87.1
	August	43	98,081	82,071	83.7	85,989	87.7
Allegheny	October	15	77,480	68,286	88.1	70,882	91.5
	September	15	77,523	68,745	88.7	70,700	91.2
	August	15	80,261	70,756	88.1	72,912	90.8
Pocahontas	October	3	8,923	7,897	88.5	8,262	92.6
	September	15	7,648	6,460	84.5	6,920	90.5
	August	3	3,970	2,949	74.3	3,073	77.4
Southern	October	33	49,945	43,440	87.0	45,222	90.5
	September	33	48,604	43,018	88.4	44,765	91.9
	August	33	49,683	42,224	85.0	44,668	89.9
Northwestern	October	15	26,274	21,288	81.0	22,286	84.8
	September	3	25,372	20,431	80.5	21,399	84.3
	August	15	25,960	19,939	76.8	21,064	81.1
Central Western	October	24	43,091	33,224	77.1	36,207	84.0
	September	24	42,312	32,412	76.6	35,485	83.9
	August	24	42,474	32,390	76.3	35,272	83.0
Southwestern	October	23	20,806	13,772	66.2	15,724	75.6
	September	23	20,010	15,459	77.3	16,792	83.9
	August	23	20,289	15,855	78.1	16,992	83.8
Average for all Regions	October	156	320,498	269,983	84.2	283,461	88.4
	September	156	317,441	267,510	84.3	279,659	88.1
	August	156	320,718	266,184	83.0	279,970	87.3

General News Department

Philadelphia has followed New York in the adoption of an ordnance providing for changing clocks, for the purpose of daylight saving, beginning the last Sunday in March, 1920, and continuing seven months, as was done this year.

F. Lavis, consulting engineer of the American International Corporation, has been re-appointed special lecturer on railway engineering, at Sheffield Scientific School, Yale University, and will resume his course of lectures which had been interrupted during the war.

Alumni of the University of Minnesota, St. Paul, Minn., have revived a movement for the removal of the Northern Pacific tracks from the university's campus. It has been planned, tentatively, to run the tracks underground to make way for new buildings which will eventually be erected. The Minnesota Alumni Weekly, a publication of the university's alumni, is carrying on the campaign for the removal of the tracks altogether, asserting that the cost of doing so will not be as great as would be the amount involved in the sinking of the tracks, aside from possible damage to the buildings under which they would run.

St. Louis Municipal Bridge

C. B. Fox, corporate director, and Baxter Brown, engineer of the Alton & Southern, have been requested to appear before the St. Louis (Mo.) Aldermanic Ways and Means Committee for the purpose of obtaining a definite statement whether they will agree to use the St. Louis Municipal Bridge across the Mississippi River. This action is the result of a proposed municipal bond issue of $1,750,000 to be expended on the bridge and which is now pending in the Aldermanic Committee. According to P. W. Coyle, traffic commissioner of the St. Louis Chamber of Commerce, officers of the Alton & Southern have promised to make use of the bridge provided an additional railroad approach and terminals are built at the west end of the structure. The Alton & Southern crosses most of the trunk railroads in East St. Louis, Ill., and the eastern bridge approach is connected with its lines. The aldermanic committee desires definite information concerning what use will be made of the bridge before approving the bond issues. Representatives of the Chamber of Commerce and the Manufacturers' Association have appealed to the committee for added funds for the proposed new bridge approach, which would run south along the Mississippi river front and connect with a proposed municipal road leading into the River des Peres Valley. It is proposed to establish an industrial district in this valley similar to that in the northwest part of the city.

Wages and Earning Power

[Letter in the Louisville (Ky.) Times, signed "A Conductor's Wife."]

I have been much interested in your editorials, as I am an L. & N. conductor's wife, and would just like to give you my side of the story. Now, I am not at all in favor of unions, although my husband is an O. R. C. man.

We have a family of six and my husband draws from $85 to $100 every two weeks, and I can live comfortably on that salary. What I mean is the way a poor, laboring man's family ought to live, not to try to belong to the "400" society. Railroad people get the swell head. They cannot get along on that salary. Then there is the man who plays poker and shoots craps all night in cabooses, especially around pay days. . . . Now this class needs more salary. Then again you take most railroad men—they are men raised in small towns and surrounding country along the line of road upon which they work and very few country boys have what I would call an education. Then what can you expect? I am not educated myself, which I guess you can see from my letter, but I would have loved to have gone to high school, but happened to be a poor man's daughter and was raised to be a good, hard-working woman, which I hope has done me just as much good. . . . My husband admits he is satisfied with his salary and I think he ought to be, for it is more than he ever made in his life, and with the education he had he could not begin to make that money anywhere else, and so it is with the rest of those country boys who shoved a plow from sunrise till dark for $1 a day. Now, with the salary they make, they want to be the president of the railroads and are trying to get Walter D. Hines' place. I would love to give my name, but you know it would never do, but I sure do love to read your editorials.

Here's luck to you and I hope there shall be no strike. If there is I think I'll take a captain's place and run a train, for I understand it better than some of these pumpkin rollers

Government Drops Oil Land Suits

The Attorney General has announced that the government will not appeal from the adverse decisions in the cases brought by the United States against the Southern Pacific and others to set aside patents to lands in California on the ground that the lands were known to contain oil when the patents were procured. The principal case was commenced in 1912. All of the cases were consolidated for trial, and the trial court found squarely against the contention of the government on the facts. The Elk Hills case recently decided by the Supreme Court in favor of the government involved facts which differed widely from those presented in these cases.

Coal Production

The rate of bituminous coal production on the working days of the fourth week of the strike (November 23-29) was 48.3 per cent of normal, according to the weekly report of the United States Geological Survey. During the first week it had been 29.6 per cent of normal; during the second 33.3, and during the third, 44.5 per cent. Because of the Thanksgiving holiday, however, the actual output was a little greater than that of the preceding week. The total production is estimated at 5,429,000 net tons, an increase of 53,000 tons, or one per cent over the week before. The output on Thanksgiving Day itself was 560,000 tons. On the five full-time days it averaged 974,000 tons. The average production per working day during the four weeks ended October 25, which may be regarded as normal, was 2,015,000 tons.

The Central Interstate Wage Conference was in session in Washington during the first four days of the week, adjourning *sine die* on Thanksgiving Day. Production increased on Monday and Tuesday, as men returned to work in the Cumberland-Piedmont, Fairmont, and other fields of the Appalachian region. No break in the strike occurred elsewhere. Production on Friday was the second highest in the week, but Saturday showed the usual week-end drop.

The total output during the month of November was 18,815,000 tons. The littleness of this tonnage—by far the smallest in any month of recent years—is conspicuous in contrast with the production of October, which revised reports now place at 56,270,000 tons, the largest in the history of the country.

The output of anthracite fell off nearly 300,000 tons during the week of November 29, but the decrease appears to be entirely due to the Thanksgiving holiday. Compared with the corresponding week last year, the production showed an increase of 185,000 tons, or 12 per cent. The total output since the beginning of the coal year now amounts to 61,555,000 tons, or about 5½ million tons less than during the corresponding period of 1918. At the present rate of production, however, the anthracite mines are rapidly catching up with their performance of last year.

REVENUES AND EXPENSES OF RAILWAYS

NINE MONTHS OF CALENDAR YEAR, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.					
Galveston, Harrisburg & San Antonio	1,381	10,742,610	4,144,957	15,623,046	2,349,199	3,572,103	157,572	5,902,410	480,395	12,583,980	80.55	3,039,067	476,033	2,558,570	—1,931,330
Galveston Wharf Co.	13	.....	.....	624,777	238,679	6,662	168	241,008	13,595	592,714	94.86	32,063	112,500	—80,437	—263,581
Georgia	328	2,790,206	1,351,672	4,453,953	473,565	753,796	73,197	2,152,193	151,118	3,605,380	58.49	848,573	54,550	793,968	—803,296
Georgia, Southern & Florida	402	2,047,628	857,366	3,177,879	536,504	753,523	55,275	500,417	95,672	2,948,713	92.78	229,166	124,641	103,903	—50,254
Georgia & Florida	348	501,511	182,317	726,899	262,634	180,878	17,101	461,238	50,157	972,008	133.71	—245,109	37,319	—283,709	—250,909
Grand Rapids & Indiana	569	3,915,725	1,645,925	6,021,948	801,789	1,336,563	93,984	2,854,989	214,710	5,329,729	88.51	692,225	234,404	459,776	112,753
Grand Trunk Western Lines	1,001	12,260,126	2,727,759	16,317,276	2,077,647	2,928,047	154,226	7,323,811	426,163	12,948,188	79.35	3,369,088	452,570	2,912,762	2,992,348
Great Northern	8,233	55,712,758	14,646,422	77,235,006	13,862,697	14,060,985	509,950	31,876,405	1,372,879	62,681,104	81.15	14,553,902	4,120,444	10,427,273	4,859,852
Gulf & Ship Island	307	1,251,782	413,212	1,797,920	471,049	429,926	35,668	746,536	82,256	1,768,761	98.37	29,159	96,692	—66,126	—455,676
Gulf, Colorado & Santa Fe	1,935	10,121,979	3,939,353	14,876,900	3,259,770	2,751,846	141,968	6,434,320	438,453	12,982,455	87.26	1,894,446	640,509	1,248,542	—1,555,600
Grand Trunk L. in New England	172	1,840,080	360,159	2,621,311	861,196	384,589	26,520	1,641,159	109,920	3,356,759	128.05	—735,448	112,500	—847,948	—412,729
Gulf, Mobile & Northern	428	1,482,161	405,484	1,991,173	420,818	486,683	51,036	935,919	90,435	1,977,615	99.31	13,557	100,805	—87,635	—283,369
Hocking Valley	350	7,150,529	891,772	8,582,986	967,972	2,785,550	53,699	2,896,403	187,069	6,886,822	80.24	1,696,163	412,282	1,279,717	—343,804
Houston & Texas Central	847	4,285,758	1,891,983	6,561,319	1,280,067	1,242,291	61,604	2,759,356	176,781	5,518,775	84.11	1,042,543	310,389	729,074	—917,758
Houston, East & West Texas	190	1,236,274	409,939	1,724,336	310,956	212,416	8,765	792,098	37,790	1,362,025	78.98	362,312	56,738	304,564	—45,631
Illinois Central	4,791	55,367,324	17,997,470	78,895,768	14,019,997	21,585,871	691,238	32,688,221	2,006,067	71,375,939	90.46	7,579,828	3,712,427	3,845,781	—6,483,620
Indiana Harbor Belt	116	.....	.....	4,802,943	839,421	934,267	15,612	4,118,535	153,112	5,060,948	105.37	—258,005	89,897	—347,912	207,781
International & Great Northern	1,159	7,261,539	2,462,105	10,377,560	2,438,347	2,803,586	118,585	5,251,689	373,632	11,045,919	106.44	—668,360	256,999	—926,357	—2,074,887
Kanawha & Michigan	176	2,592,320	507,908	3,204,565	472,548	1,193,033	21,731	1,177,754	116,401	2,981,479	93.03	223,085	164,883	58,198	—966,629
Kansas City, Mexico & Orient	272	783,690	159,353	989,121	394,151	372,784	12,851	557,257	67,392	1,404,436	141.98	—415,315	56,300	—471,770	—209,725
Kansas City, Mexico & Orient of Texas	465	644,440	135,238	826,918	301,836	368,094	13,593	575,400	69,666	1,328,590	160.66	—501,672	44,906	—546,653	—317,319
Kansas City Southern	774	8,286,590	1,795,818	10,897,290	1,771,163	2,462,652	151,811	4,432,916	361,095	9,165,136	84.10	1,732,154	583,636	1,143,758	—1,443,050
Kansas City Terminal	27	.....	.....	1,010,412	161,765	218,993	.....	424,653	12,045	827,999	81.94	182,412	212,016	—29,681	1,265
Lake Erie & Western	902	6,192,038	600,131	7,115,940	1,247,964	2,060,364	107,961	3,148,626	212,963	6,773,373	95.18	342,567	301,406	38,951	—510,429
Lehigh & Hudson River	96	1,843,900	36,453	1,947,440	239,522	432,679	13,524	811,180	52,280	1,549,186	79.54	398,254	48,966	349,269	120,647
Lehigh & New England	231	2,621,744	14,213	2,769,778	410,197	606,449	24,673	981,528	87,897	2,109,157	76.14	660,620	72,571	588,050	—229,307
Lehigh Valley	1,435	37,752,856	5,240,505	47,169,811	7,039,266	12,837,960	378,798	21,514,439	962,799	42,895,441	90.93	4,274,369	1,428,600	2,844,259	—1,656,979
Long Island	398	4,506,730	12,743,535	19,048,549	2,438,067	3,079,091	114,108	8,906,005	430,976	15,094,182	79.24	3,954,368	827,405	3,123,819	—1,432,909
Louisiana & Arkansas	302	1,136,239	342,531	1,533,754	450,906	369,803	30,009	683,596	55,717	1,590,032	103.66	—56,278	101,913	—158,301	—249,695
Louisiana Ry. & Nav. Co.	349	2,120,940	326,788	2,583,090	712,437	488,205	35,112	1,173,306	69,993	2,479,052	95.97	104,038	130,000	—26,136	—339,850
Louisiana Western	207	1,858,906	998,362	2,988,170	458,719	566,995	36,378	857,077	96,727	2,034,902	68.09	953,268	82,338	870,736	—529,473
Louisville & Nashville	5,013	55,912,909	18,598,739	78,592,993	12,233,772	20,676,891	1,051,268	32,569,420	1,699,656	68,512,471	87.17	10,080,522	2,304,926	7,767,802	—6,957,969
Louisville, Henderson & St. Louis	199	1,480,607	589,051	2,165,590	449,236	295,930	51,432	828,933	68,298	1,693,827	78.22	471,763	36,000	435,052	—118,361
Maine Central	1,216	8,146,570	3,775,689	12,852,475	2,302,380	2,986,777	110,578	7,242,756	323,526	13,000,067	101.14	—147,591	681,609	—828,500	—905,399
Maryland, Delaware & Virginia	82	617,180	382,502	1,024,240	81,457	259,405	5,827	655,665	19,071	1,021,426	99.72	2,814	15,919	—13,125	6,436
Michigan Central	1,861	37,220,328	14,838,044	56,918,226	7,344,531	11,115,303	589,017	21,057,806	992,589	41,746,260	73.34	15,171,966	1,825,000	13,342,212	3,209,196
Mineral Range	101	547,332	3,503	574,484	109,614	194,087	3,738	315,554	8,782	632,374	110.07	—57,890	32,000	—89,890	—69,973
Minneapolis & St. Louis	1,646	7,157,037	2,082,442	9,962,243	1,728,839	2,399,365	93,868	4,701,903	266,478	9,184,189	94.75	508,053	455,103	49,011	107,749
Minn., St. Paul & Sault Ste. Marie	4,243	22,560,294	6,154,153	30,679,836	4,694,333	6,219,596	219,568	12,792,330	686,797	24,772,278	80.74	5,907,558	1,808,941	4,096,864	2,677,154
Miss. Central	164	448,570	253,223	739,536	188,998	278,416	11,168	310,535	52,712	841,829	113.83	—102,293	28,875	—131,374	—379,868
Missouri & North Arkansas	365	704,079	371,896	1,145,087	550,876	341,318	18,510	567,968	80,703	1,558,412	136.09	—413,325	57,110	—471,715	—517,223
Missouri, Kansas & Texas	1,713	17,693,931	6,039,008	25,092,592	4,570,678	7,022,129	254,096	8,558,346	700,747	21,209,323	84.52	3,883,268	834,721	3,046,244	559,471
Missouri, Kansas & Texas of Texas	1,796	10,990,274	5,877,781	18,117,970	3,781,382	3,315,469	202,758	9,166,784	670,669	17,288,446	95.42	829,524	469,303	385,242	181,216
Missouri, Oklahoma & Gulf	332	797,231	164,122	1,020,707	492,517	440,165	16,882	613,438	63,011	1,628,105	159.51	—607,398	76,538	—684,852	—389,926
Missouri Pacific	7,172	47,640,663	15,352,217	67,483,924	13,421,904	15,290,256	754,952	28,337,549	1,850,107	59,962,969	88.85	7,520,956	2,398,114	5,098,368	—5,530,398
Montour	54	.....	915,321	970,403	269,748	531,579	11,382	251,988	58,458	1,124,836	115.91	—154,433	20,784	—175,223	—227,074
Mobile & Ohio	996	8,840,219	1,651,017	11,130,330	1,910,599	3,655,599	213,473	5,349,057	368,769	11,504,133	103.36	—373,802	458,022	—832,800	—982,152
Monongahela	108	2,413,280	184,512	2,620,815	543,085	336,989	8,857	810,738	63,538	1,763,208	67.27	857,607	45,000	812,587	122,435
Monongahela Connecting	6	.....	.....	1,316,710	220,136	473,621	4,657	662,929	63,217	1,424,559	108.19	—107,849	18,438	—126,288	—384,794
Morgan's Louisiana & Texas R. R.	400	3,678,765	1,557,748	5,565,811	969,649	1,212,330	72,089	2,321,763	179,661	4,773,219	85.76	792,592	274,716	516,627	—1,300,066
Nashville, Chattanooga & St. Louis	1,247	9,459,577	4,042,321	14,426,089	2,562,448	3,671,691	306,250	6,420,970	392,408	13,433,833	93.12	992,256	450,000	539,503	—2,179,195
Nevada Northern	168	961,827	88,713	1,105,634	191,198	189,652	8,385	319,260	38,257	747,814	67.63	357,821	177,484	180,336	—686,895
New Orleans & N. E.	398	3,059,405	1,132,503	4,781,506	856,629	1,022,570	70,698	2,233,051	134,588	4,364,249	91.26	417,256	255,213	161,290	—672,967
New Orleans Great Northern	284	1,251,548	399,461	1,722,600	343,065	381,885	21,536	728,926	78,440	1,557,467	90.41	165,133	85,861	76,334	—318,366
New Orleans, Texas & Mexico	191	1,017,917	335,060	1,431,109	358,835	347,958	25,153	488,022	54,608	1,294,576	90.45	136,532	90,000	46,328	—264,161
New York Central	6,075	138,075,322	64,574,461	229,010,770	29,752,046	48,994,882	2,031,012	94,547,703	5,667,587	184,386,865	80.51	44,623,906	8,407,319	36,204,716	5,954,666
New York, Chicago & St. Louis	574	15,656,034	1,553,372	17,707,487	2,205,779	3,268,180	230,667	7,260,379	474,135	13,472,188	76.08	4,235,299	465,006	3,769,531	961,920
New York, New Haven & Hartford	1,965	34,749,059	33,303,292	76,728,381	10,326,493	15,630,360	415,335	37,468,384	2,385,305	67,553,475	88.04	9,174,905	2,536,000	6,623,853	—4,626,776
New York, Ontario & Western	569	4,748,812	2,334,819	8,391,820	1,261,320	1,930,676	76,649	3,653,628	204,535	7,126,809	84.92	1,265,010	236,800	1,028,241	—29,443
New York, Philadelphia & Norfolk	121	4,607,997	1,076,303	6,098,830	486,376	1,511,666	78,806	2,823,109	101,493	5,169,852	84.76	928,979	154,343	774,598	—55,000
New York, Susquehanna & Western	135	1,993,099	517,953	2,870,714	299,528	492,075	19,742	1,770,519	72,349	2,654,337	92.46	216,378	288,966	—73,302	—207,093
Newburgh & South Shore	7	.....	.....	1,047,815	176,737	263,553	.....	540,954	34,766	1,016,009	96.96	31,805	64,014	—32,209	—160,406
Norfolk Southern	906	3,036,172	1,360,914	4,687,081	991,645	918,274	68,452	2,390,551	187,217	4,560,073	97.29	127,007	163,850	—37,341	—306,270
Norfolk & Western	2,088	45,164,709	8,355,426	56,023,042	7,496,213	16,390,941	322,923	20,482,817	952,207	45,796,325	81.74	10,226,717	2,340,000	7,885,383	—4,462,529
Northern Pacific	6,581	52,047,654	15,209,072	72,543,473	12,702,244	12,618,071	541,046	27,478,904	1,662,697	55,764,490	76.87	16,778,983	5,518,550	11,244,731	—2,653,074
Northern Ala.	112	696,327	119,896	842,420	192,072	50,956	11,973	523,737	16,343	794,922	94.35	47,498	30,900	16,590	—248,210
Northwestern Pacific	527	2,463,644	1,847,107	4,789,378	903,788	626,454	46,363	2,059,936	115,240	3,767,481	78.66	1,021,896	208,583	811,948	—481,867
Oregon Short Line	2,347	20,663,985	5,283,693	27,667,468	4,607,073	4,764,538	149,143	8,190,176	826,573	19,068,061	68.91	8,599,408	1,481,583	7,115,808	—612,201
Ore., Wash. & Nav. Co.	2,070	14,112,824	5,079,608	20,779,092	3,749,597	3,185,101	256,754	8,178,565	853,187	16,453,431	79.18	4,325,662	1,024,358	3,299,015	—607,388
Panh. & Santa Fe	772	3,330,533	885,568	4,420,152	871,098	1,530,654	35,554	2,034,789	132,695	4,592,512	103.89	—172,360	158,850	—332,255	—802,707

REVENUES AND EXPENSES OF RAILWAYS

NINE MONTHS OF CALENDAR YEAR, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight	Passenger.	Total (Inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Penn R. R. West	1,754	56,366,001	15,895,029	78,583,585	10,905,590	21,001,572	674,246	33,868,881	1,694,701	68,218,737	86.81	10,364,848	2,776,973	7,585,284	3,873,096
Penn. R. R. East	5,367	179,609,457	79,701,418	282,854,125	40,451,267	79,951,992	2,364,145	123,049,275	6,573,862	257,435,911	91.01	25,418,214	8,124,188	17,278,035	—2,385,541
Perkiomen	41	707,245	77,417	813,884	51,078	38,809	195	327,110	3,025	420,402	51.65	393,482	16,200	377,282	55,863
Peoria & Pekin Union	19	248,157	33,605	867,067	157,496	362,828	7,151	671,724	47,863	1,247,062	143.82	—379,994	85,500	—465,494	—287,027
Pere Marquette	2,232	18,902,920	4,585,087	25,427,031	2,699,792	5,016,887	252,968	10,427,416	626,800	19,114,876	75.17	6,312,155	486,166	5,823,746	3,002,056
Phila. & Reading	1,127	42,868,243	7,917,261	53,764,312	5,706,172	14,122,409	336,299	25,985,431	1,211,014	47,512,787	88.37	6,251,525	1,289,053	4,962,367	—6,221,822
Pitts. & L. Erie	224	17,687,850	1,961,899	21,308,436	3,511,835	6,249,661	129,376	7,485,436	394,199	17,781,497	83.44	3,526,939	672,500	2,854,205	—4,565,185
Pitts. & W. Va	63	803,007	87,803	1,005,820	474,150	375,595	11,598	480,398	50,663	1,463,996	145.55	—458,176	104,963	—563,270	—476,692
Phila., Bethlehem & N. E	71	.....	.....	610,504	69,650	109,869	3,084	394,991	9,761	587,356	96.21	23,149	11,643	11,506	—146,146
Pitts. & Shawmut	103	813,354	37,716	862,302	297,475	351,484	14,470	319,444	27,422	1,010,295	117.16	—147,992	8,755	—156,748	—212,376
Pitts., Cinc., Chicago & St. L	2,383	45,947,851	16,666,577	68,989,660	9,113,333	20,879,857	785,896	30,527,415	1,575,608	63,524,165	92.07	5,465,501	2,153,649	3,309,503	—1,410,579
Pitts., Shawmut & Northern	204	752,598	54,357	834,212	222,576	441,035	8,806	346,553	66,122	1,085,129	130.07	—250,916	16,624	—267,559	102,257
Port Reading	21	1,190,603	.....	1,902,527	160,026	121,517	146	908,437	10,851	1,200,976	63.13	701,552	81,000	620,552	131,629
Rich., Fed. & Pot	81	2,848,624	2,578,322	5,927,596	473,610	792,019	39,228	1,929,019	117,938	3,446,854	58.14	2,480,742	114,229	2,366,435	217,601
Quincy, Omaha & K. City	258	527,474	231,378	812,554	315,700	146,012	2,087	421,045	11,875	894,070	110.03	—81,516	27,384	—108,964	34,619
Rutland	415	1,871,823	1,035,052	3,529,313	597,289	865,147	59,968	1,657,602	102,798	3,290,064	93.22	239,249	172,698	66,487	—84,669
St. J. & Grand Island	258	1,664,374	388,753	2,170,767	435,270	337,688	17,150	1,154,019	106,211	2,058,023	94.81	112,744	88,433	24,213	—8,880
St. L., Brownsville & Mex	548	2,535,487	1,209,545	3,968,998	714,778	655,852	49,888	1,149,537	141,783	2,711,838	58.32	1,257,160	90,000	1,166,473	277,494
St. L., Merchants Bridge Term	9	.....	5,474	2,186,665	496,015	368,880	6,681	1,596,654	54,293	2,522,523	115.35	—335,858	72,000	—407,867	—521,331
St. L.-San Francisco	4,761	37,295,018	16,533,163	56,701,301	8,823,559	11,249,619	476,059	21,530,845	1,574,641	43,514,042	76.74	13,187,259	2,049,118	11,118,052	2,586,507
St. L.-San Francisco & Texas	134	904,587	153,550	1,126,561	190,856	195,302	14,916	596,044	55,090	1,061,208	94.20	65,353	13,898	51,274	—120,891
St. Louis Southwestern	939	7,625,982	1,614,103	9,640,490	1,597,522	2,150,492	149,892	2,993,780	366,554	7,311,472	75.84	2,329,018	380,569	1,946,288	—1,150,193
St. Louis Southwestern of Texas	814	3,372,759	1,122,057	4,793,213	1,220,099	1,632,114	75,164	2,480,501	210,468	5,608,941	117.01	—813,729	189,000	—1,004,068	—902,088
San Antonio & Aransas Pass	736	2,095,705	916,630	3,212,015	914,907	959,336	54,901	1,765,809	151,365	3,843,209	119.65	—631,194	135,000	—767,522	—442,460
Seaboard Air Line	3,563	18,012,331	9,647,180	30,298,801	4,579,093	6,475,683	548,247	14,424,756	965,385	27,332,464	89.87	3,066,337	1,215,006	1,847,236	—2,039,848
St. L. Transfer	6	.....	.....	808,989	106,501	105,636	1,722	371,815	19,634	605,308	74.82	203,680	1,030	202,650	57,686
South Buffalo	11	324,008	.....	778,000	47,072	144,324	3,191	466,158	15,898	676,642	86.97	101,359	33,000	68,359	—168,590
Southern	6,982	58,090,915	28,071,454	93,426,289	17,565,573	20,035,977	1,109,508	40,558,670	2,396,240	82,377,318	88.17	11,048,971	2,937,397	8,057,543	—16,166,328
Southern Ry. in Mississippi	278	743,097	428,119	1,256,929	332,281	177,248	21,014	693,633	37,190	1,261,365	100.35	—4,435	81,000	—85,905	—70,941
Southern Pacific	7,049	81,019,157	31,748,914	121,754,836	19,212,702	24,080,721	1,058,642	46,167,300	2,136,710	95,020,986	78.05	26,733,849	5,759,978	20,950,023	—3,996,984
Spokane, Portland & Seattle	538	3,641,485	1,382,177	5,400,327	881,275	761,750	52,586	1,819,070	177,422	3,713,261	68.75	1,687,067	532,800	1,153,848	—817,655
Southern Steamship Lines	.....	6,986,980	438,559	7,825,960	88,966	2,029,410	111,986	5,965,354	227,568	8,423,284	107.63	—597,324	93,575	—690,910	—866,710
Spokane	156	638,201	150,070	811,260	156,771	72,793	15,325	271,388	39,418	553,702	68.25	257,558	40,030	217,528	—8,267
Staten Island Rapid Transit	23	772,385	728,041	1,714,896	232,609	237,343	8,819	893,925	81,580	1,454,276	84.80	260,621	121,000	139,576	43,041
Tennessee Central	293	1,337,693	438,680	1,879,923	686,251	463,744	26,065	904,133	58,806	2,138,219	113.73	—258,296	46,040	—304,538	—565,042
Terminal R. R. Ass'n of St. Louis	36	.....	31,730	2,832,569	656,616	495,234	7,177	1,257,004	48,926	2,446,129	88.12	336,441	244,705	91,583	—179,143
Texarkana & Ft. Smith	87	819,635	155,666	1,071,325	175,018	176,516	9,845	476,693	28,724	861,285	80.39	210,040	59,592	150,371	34,700
Texas & New Orleans	469	3,871,172	1,528,035	5,895,235	1,048,282	1,619,734	41,770	2,118,413	128,230	5,207,213	88.32	638,022	192,201	491,944	—487,672
Texas & Pacific	1,946	17,156,356	7,410,674	25,891,044	3,676,824	5,486,060	226,822	11,532,357	640,458	21,771,511	84.08	4,119,533	809,823	3,305,191	356,302
Toledo & Ohio Central	433	5,883,642	597,202	6,850,660	1,143,787	2,052,137	57,702	2,873,826	150,356	6,301,029	91.97	549,631	289,382	260,185	—150,549
Toledo, Peoria & Western	247	701,159	441,308	1,203,479	238,844	346,941	18,649	626,352	49,040	1,277,287	106.13	—73,808	76,500	—150,308	—59,983
Toledo, St. L. & Western	454	5,168,137	375,829	5,822,413	1,101,658	1,261,216	52,199	2,426,365	105,412	4,944,508	84.92	877,904	234,000	643,800	—382,868
Trinity & Brazos Valley	368	725,044	187,365	958,803	369,239	401,336	16,121	537,036	65,866	1,389,596	144.93	—430,793	51,339	—482,234	—134,820
Ulster & Delaware	128	492,636	231,098	891,807	141,555	170,456	12,315	598,089	42,719	969,530	108.71	—77,723	43,200	—120,975	—90,241
Union R. R. of Penn	40	.....	.....	5,840,101	693,918	1,607,787	2,327	3,130,797	67,665	5,501,438	94.20	338,663	66,277	272,386	—94,186
Union Pacific	3,614	58,168,839	16,690,486	80,746,408	11,074,520	14,702,678	410,882	22,710,213	2,103,530	52,831,399	65.42	27,915,009	2,191,011	25,717,587	879,142
Vicks., Sheve. & Pacific	171	1,532,279	697,079	2,408,424	405,678	526,912	29,430	882,479	78,651	1,945,084	80.76	463,340	102,070	360,901	84,462
Virginian Ry	522	7,270,896	534,631	8,628,253	1,387,662	1,874,720	42,316	3,121,857	148,260	6,571,526	76.16	2,056,727	314,200	1,742,458	—325,098
Wabash	2,503	24,875,261	7,571,746	34,727,202	5,640,702	6,701,822	486,150	17,786,160	1,024,206	31,844,150	91.69	2,883,053	976,776	1,902,138	—2,621,896
Washington Southern	35	1,150,194	1,807,265	3,532,585	307,502	369,452	21,715	1,061,540	49,214	1,857,421	52.58	1,675,165	58,742	1,616,386	394,137
West Jersey & Seashore	361	2,635,500	6,250,160	9,497,455	1,764,967	1,829,801	74,745	4,428,855	190,700	8,335,980	87.77	1,161,475	424,398	736,565	—56,605
Wichita Falls & N. W	328	1,147,673	374,531	1,593,145	461,778	224,043	11,162	855,329	61,176	1,613,489	101.26	—20,344	85,360	—106,362	184,955
Western Md	701	9,154,177	817,987	10,889,628	2,023,149	3,550,190	158,059	4,256,683	402,250	10,498,563	96.40	391,066	388,800	2,265	306,071
Western Pacific	1,041	7,643,882	1,358,740	9,365,243	2,061,461	1,650,032	110,293	2,944,476	220,251	7,154,568	76.39	2,210,675	421,633	1,788,225	—652,703
Western Ry. of Ala	133	1,016,854	726,858	1,888,537	231,875	381,195	27,307	703,614	56,144	1,431,962	75.82	449,576	67,500	382,074	—89,377
Wheeling & L. Erie	511	8,092,289	493,633	9,518,616	1,920,333	2,216,659	54,312	3,743,672	224,658	8,183,495	85.97	1,335,121	507 125	826,938	—531,814
Yazoo & Miss	1,381	13,351,726	3,896,027	18,000,645	2,896,878	3,929,795	140,330	6,519,418	431,546	13,753,312	76.40	4,247,333	539,632	3,705,368	354,616
Minn. & International	194	529,367	224,093	799,871	203,061	147,191	4,531	422,535	31,043	808,361	101.06	—8,490	43,119	—51,623	—48,555
Lake Erie & Ispeming	34	730,869	2,104	823,343	174,803	157,834	1,816	165,925	22,797	523,175	63.54	300,168	30,954	269,215	—346,517
Copper Range	141	582,962	111,325	748,172	233,697	166,036	15,143	329,201	25,303	769,579	102.83	—21,206	56,431	—77,638	—155,881
Erie, Lebanon & Nor	76	613,216	68,786	810,079	169,310	173,284	12,044	464,523	8,193	827,354	102.13	—17,275	39,058	—56,333	—55.873
Green Bay Western	252	668,584	149,323	872,035	195,041	222,785	10,097	376,210	17,346	821,426	94.19	50,609	39,512	11,097	—41,805
Los Angeles & Salt Lake	1,168	8,610,246	3,159,712	12,503,473	1,908,632	2,657,301	165,047	4,190,603	272,998	9,530,699	76.22	2,972,773	615,746	2,335,541	270,171
Midland Valley	388	2,042,177	730,819	2,877,453	627,640	524,361	27,052	1,066,884	112,770	2,360,708	82.04	516,745	62,060	453,287	—181,343
Utah	98	854,391	4,935	865,318	119,411	189,973	1,880	176,631	18,901	506,797	58.56	358,521	33.690	324,831	—181,492

Commission and Court News

Personnel of Commissions

Walter M. O'Loughlin, senior railway signal engineer in charge of the field party of the Central District, Bureau of Valuation, of the Interstate Commerce Commission, with headquarters at Chicago, has been promoted to have charge of the signal branch of the same office with the same headquarters. Mr. O'Loughlin was born at Terre Haute, Ind., in 1885. He graduated from Rose Polytechnic Institute, Terre Haute, in 1907, and in the same year entered railway service with the Pennsylvania Lines as a special signal apprentice. He remained in this position until 1909 when he was appointed a draftsman in the Chicago office of the Chicago, Rock Island & Pacific. From 1909 until 1913 he was successively draftsman, engineering draftsman and signal supervisor. As signal supervisor his headquarters were at Lincoln, Neb., and later at Chicago. In 1913 he was appointed signal supervisor in charge of maintenance and construction on the eastern district of the Northern Pacific with headquarters at St. Paul, Minn., which position he held until 1915, when he was appointed senior railway signal engineer in charge of the field party of the Central District, Bureau of Valuation, of the Interstate Commerce Commission. As senior railway signal engineer in charge of the signal branch of the Central District, Mr. O'Loughlin assumes part of the duties of Joseph Beaumont, whose resignation was announced in the delayed October 17 number of the *Railway Age* issued on November 29.

W. M. O'Loughlin

Alexander C. Jenkins, telegraph and telephone engineer for the Bureau of Valuation, Interstate Commerce Commission, supervising field and office forces on telegraph and telephone inventory, with office at Chicago, Ill., has been promoted to senior telegraph and telephone engineer of the Central District of the Bureau, in charge of the field and office forces on telegraph and telephone inventory, with the same headquarters. Mr. Jenkins assumes part of the duties of Joseph Beaumont, whose resignation was announced in the delayed October 17 number of the *Railway Age*, issued on November 29. Mr. Jenkins was born at Alamosa, Iowa, in 1874, and was graduated from Iowa State College, Ames, Iowa, in 1902. The same year he entered telephone service with M. H. Harter, engineer and contractor, in the construction of electric light plants and independent telephone plants in Iowa and South Dakota. In 1903 he became connected with the engineering department of the Bell Telephone Company, with headquarters at Pittsburgh, Pa., having to do with the design of aerial and underground telephone plants, electrical interference of high tension lines with telephone lines and studies determining office locations, conduits, cable- and pole-line extensions. In 1907 he was promoted to assistant to the plant superintendent in which capacity he served until 1910. In the latter year he was promoted to district construction superintendent of the same company, with headquarters at Kansas City, Mo. From 1912 until 1914, he was plant supervisor at Newcastle, Pa. In September, 1914, he was appointed telegraph and telephone engineer, as above, which position he held until his recent promotion.

A. C. Jenkins

J. S. Worley, member of the Engineering Board of the Bureau of Valuation of the Interstate Commerce Commission in charge of valuation work in the western district with headquarters at Kansas City, Mo., has resigned, effective January 1, 1920, to engage in other service.

State Commissions

The contention of the Southern Pacific Company that it should be considered in the same category as the ordinary householder to whom the East Bay Water Company, Oakland, Cal., is under obligation to provide service at any time and for brief periods, was not sustained by the Railroad Commission of California in a recent decision. The Commission granted the East Bay Water Company authority to remove certain pipe lines and facilities supplying water to the Southern Pacific at its Oakland Pier roundhouse, yard, freight office and wharves. Under the authority granted by the Commission the water company is empowered to substitute smaller pipes unless the railroad agrees to pay certain amounts monthly in addition to the established rates for water.

Court News

Decisions Under Employers' Liability Act

The Illinois Appellate Court holds that where a switching crew after delivering a cut of cars, concededly a task involving interstate commerce, returned to the yardmaster's quarters for the purpose of obtaining orders for future work, the crew while awaiting such orders was not engaged in interstate commerce, and an injury sustained during the time of waiting by one of them was not within the act.—Bishop v. Chicago Junction Ry. Co., 212 Ill. App. 333.

The New York Appellate Division holds that a railroad employee who was fatally burned while cleaning a car homeward bound on an interstate trip while it was standing in the railroad's yard awaiting delivery to another carrier, was at the time engaged in "interstate commerce," and was not entitled to recover under the Workmen's Compensation Act.—Kinsella v. N. Y. C., 186 App. Div. 856, 175 N. Y. Supp. 363.

Federal Employers' Liability Decisions

The Supreme Court of Illinois holds that a janitor in shops in which slight repairs were made upon certain trains, both in interstate and intrastate commerce, and who was injured by a splinter when breaking kindling, was not engaged in interstate commerce.—Heed (receiver of C. & E. I. v. Industrial Commission, (Ill.) 122 N. E. 801.

The Oklahoma Supreme Court holds that an employee injured while engaged in transporting in a motor-driven car workmen from their residences to the roundhouse of the company, where they were to make running repairs on cars and engines used in both interstate and intrastate commerce, was not engaged in interstate commerce.—St. Louis I. M. & S. v. True (Okla.) 176 Pac. 758.

The Kansas Supreme Court holds that a station agent who was injured by attempting to start a fire in the stove by the use of kerosene was not engaged in interstate commerce; it cannot be said that his work at the time had a real and substantial connection with interstate commerce.—Benson v. Bush, (Kan.) 178 Pac. 747.

Foreign Railway News

Bolivia Plans Railroad

Press despatches from La Paz, Bolivia, report that announcement has been made that the Minister of Public Works has named a commission to survey a route for the proposed railroad to run from the city of Puno, in Peru, around the eastern end of Lake Titicaca to Cuaqui, the Bolivian port on Lake Titicaca.

The construction of this line would obviate the necessity of transshipment by the Lake Titicaca Steamship Company of goods bound from Mollendo to La Paz, on the Southern Railroad of Peru. This transshipment is expensive, for it necessitates two extra handlings, and it is believed that if this could be done away with by a railroad around the lake the resultant decrease in expenditures would make possible a lowering of the rates from Mollendo to La Paz. Such a decrease in rates is greatly needed, for at the present time the revenues of the Southern Railroad are suffering severely from the competition of the shorter Arica-La Paz Railroad.

New Express Locomotives for Holland

London.

An extract from De Ingenieur by the Technical Review gives the description of the latest and most powerful locomotives supplied to the Dutch Central Railway just before the war by J. A. Maffer of Munich.

Four of the engines are fitted with ordinary superheaters placed in the smokebox, and the four with Schmidt's fire-tube superheaters. The locomotives are similar in other respects and of the following general dimensions:

	Engine Nos. 71-74	Engine Nos. 75-78
Number of cylinders	4	4
Diameter of cylinders	15¾ in.	15¾ in.
Length of stroke	25½ in.	25¼ in.
Diameter of coupled wheels	6 ft. 2 in.	6 ft. 2 in.
Diameter of boiler	5 ft. 3 in.	5 ft. 3 in.
Height of boiler above rail level	9 ft. 8 in.	9 ft. 8 in.
Grate surface	37 sq. ft.	37 sq. ft.
Diameter of boiler tubes	1¾ to 2 in.	1¾ to 2 in.
Number of tubes	285	169
Number of flue tubes	.....	24
Diameter of flue tubes	.....	5 in. to 5¼ in.
Length between tube plates	13 ft. 9 in.	13 ft. 10 in.
Heating surface, firebox	.....	168 sq. ft.
Heating tube surface, sq. ft.	1,890	1,555
Heating smokebox superheater	296	.....
Heating firetube superheater, sq. ft.	.....	500
Total heating surface	2,360	2,230
Steam pressure in lb. per sq. in.	.....	174 lb.
Tractive force in lb.	20,300	20,300
Weight of locomotive when working	69.5 tons	70 tons
Adhesive weight of engine	48 tons	48 tons
Weight of tender in working order	48.3 tons	49.1 tons
Water capacity	4,620 gallons	4,620 gallons
Coal capacity	5 tons	5 tons

The locomotives are provided with spare boilers arranged in such a manner that the working boiler can be removed and a spare fitted in its place while the old boiler is overhauled. Owing to scarcity of copper all spare boilers are constructed with fireboxes of steel instead of copper.

The locomotives are, in addition, provided with Knorr cylindrical feed water heaters having a heating capacity of 146 sq. ft. and a capacity of 55 gallons of water per minute. They are fixed on plate supports between the boiler and engine frame. frame.

Chilean Railroads

Santiago-Valparaiso via Casablanca.—The engineers who have been surveying from Valparaiso to Santiago via Casablanca are in Santiago, arranging the results of their field work. It is calculated that July next will see this survey completed if the necessary funds are forthcoming.

Arica-La Paz.—An increase of $214,387 gold has been agreed upon in the extraordinary subsidy conceded to the Arica-La Paz Railway by the Law No. 3319 of September, 1917; and the one hundred covered 25-ton cars and the three Mallet locomotives bought in North America are declared free from import duty.

General Improvements.—A bill is being laid before Congress asking for authority to use 15,000,000 pesos of the funds set apart for the purchase of ships for the navy, in carrying out the urgent improvements necessary for the service of the railway department; the money to be returned to the naval funds out of the loan of 160,000,000 pesos which probably will be arranged for November. Some reports say the probable financiers are English firms, other reports say a group of United States bankers are taking it up.

Hump Shunting in Rhineland

London.

An article published in the North Eastern Railway Magazine describes the methods employed in shunting and marshalling trains in Rhineland.

The heaviest gradient of the hump is about 1 in 8 from the summit to a distance of about 150 ft., from which point to the middle of the yard there is a slightly falling gradient. Similarly from the other end of the yard a sister hump performs the same office, the total distance between each hump being about 2,700 ft. On a normal day an average car (loaded or empty) is found to travel half the distance quite comfortably, and a strong opposing wind is found not to hold the car appreciably. On every hump there are two shunting tracks, on one of which a light engine is standing ready to run down and pick up a wrongly shunted car and reshunt it off its own hump, thus avoiding any delay to the main shunt. There are two signal cabins, one at the foot and one at the summit of the hump. The signal cabin at the foot of the hump is fitted with an electric frame. When the switches are turned, a bell rings in the cabin and as soon as the switch is closed, it ceases ringing. If the switch is not properly closed the bell keeps up a continuous ringing, giving the signalman time to switch the car to another track and advise the cabin on top of the hump that the points are defective.

During daylight the signalman sets his switches according to the large chalk numbers on the buffers of the cars, which he can see as the cars come over the hump. At night he obtains this information from the shunter's cabin on the hump through a telephonic megaphone fixed above the electric frame, which he can hear or speak into from any part of his cabin. The lamp indicators of the points have a lever number affixed for the information of the signal fitters in their work. It is also arranged that a "dolly" indicates by the arrow on one side that the turn-out is open, otherwise a vertical line shows the points are set for a straight run through.

As German cars are not constructed with side brakes, an effective method has been devised for stopping the cars in the use of the shoes. The shoe is placed on the rail about four to five car lengths from the train in dry weather and twice that distance when the rails are greasy. With an experienced "shoeman" the cars drop on to their train very gently.

The German shunting poles are an iron fork very similar to a hoe with two prongs. One prong is placed in the link of the coupling and the shunter levers the other prong against the hook.

All classes of traffic pass over the hump, from ordinary cars to special vehicles such as are required for heavy machinery, etc. The engine shunting the train operates at about 3 m. p. h. and it is proved that there is a considerable saving of coal and oil compared with other forms of shunting. The cars leave the top of the hump about two or three car-lengths apart, except in the case of special vehicles, when more space is allowed. During busy shunting periods there is usually one "shoeman" to every two tracks, and one to every three when the shunting is less. Cars are shunted according to the stops of the train, viz., those for first stopping place and exchange being placed next to the engine and so on.

A rule of the German yard is that not more than three loaded or five empty cars may travel together unaccompanied by a brakeman to their line. In one case a train composed of 40 cars requiring 24 shunts was dealt with in ten minutes on dry rails. The German estimate is 15 minutes for every train of approximately 50 cars.

Equipment and Supplies

Locomotives Shipped in August

The Railroad Administration has compiled the following statement of locomotives shipped for the period August 1 to August 31, inclusive:

For period August 1 to August 2

Works.	Road	No.	Type
American	Vgn.	3	USRA Mallet
		3	
Baldwin	AT&SF	2	Santa Fe
	PLW	2	USRA S. F.
	T&P	2	USRA Mik.
	A&V	3	Santa Fe
	A&V	1	Mikado
	B&O	1	USRA Pac.
	PLW	1	Mallet
		12	

For week August 3 to August 9

Works	Road	No.	Type
American	NC&StL	4	USRA Mt.
	Vgn.	1	USRA Mal.
		5	
Baldwin	PLW	4	Santa Fe
	AT&SF	6	Santa Fe
	PLW	7	USRA S. F.
	T&P	4	USRA Mik.
	C&O	1	USRA Mal.
	P&R	1	Mallet
	N&W	1	Mallet
		24	

For week August 10 to 16

Works	Road	No.	Type
American	NC&StL	1	USRA Mt.
	Vgn.	1	USRA Mal.
	ACL	3	USRA Pac.
		5	
Baldwin	T&P	2	USRA Mik.
	PLW	3	Santa Fe
	PLW	7	USRA S. F.
	AT&SF	3	Santa Fe
	C&O	2	USRA Mal.
	P&R	1	Mallet
	SAL	1	USRA S. F.
	SP	1	Santa Fe
		20	

For week August 17 to August 23

Works	Road	No.	Type
American	ACL	6	USRA Pac.
		6	
Baldwin	SAL	6	USRA S. F.
	PLW	2	Santa Fe
	AT&SF	2	Santa Fe
	C&O	1	USRA Mal.
	PLW	4	USRA S. F
	T&P	1	USRA Mik.
	N&W	1	Mallet
		17	

For period August 24 to August 31

Works	Road	No.	Type
American	Vgn.	1	USRA Mal.
	ACL	8	USRA Pac.
		9	
Baldwin	IHB	16	USRA Mik.
	P&R	1	Mallet
	Pa.Lines	2	Santa Fe
	SAL	3	USRA S. F.
	C&O	1	USRA Mal.
	Pa.Lines	1	USRA S. F.
	Pa.Lines	1	Mallet
	N&W	1	USRA Mal.
	W&LE	1	USRA Mal.
		11	
	Grand total	128	

In addition to the above, the American Locomotive Company completed 119 foreign and shipped 18 miscellaneous domestic locomotives, and the Baldwin Locomotive Works completed 54 foreign and shipped 14 miscellaneous domestic locomotives.

Supply Trade News

The heat treatment department of the **Quigley Furnace Specialties Company,** 26 Cortlandt street, New York, has been placed under the management of **H. H. Harris,** who has a wide experience in the heat treating field and comes to the Quigley company well equipped with information and practical experience in this important department.

Trade Publications

CHAIN DRIVES.—"A Chain of Evidence" is the title of a 20-page illustrated booklet published by the Morse Chain Company, Ithaca, N. Y., describing the construction of Morse silent chains, a distinguishing feature of which is the "rocker joint," consisting of a rolling or rocking bearing in each joint, which permits a rolling friction in place of the sliding fricton common to other types of jonts. Among a number of illustrations of large power drives contained in the booklet is one showing the largest chain drive in the world—of 5,000 hp. for hydro-electric purposes.

STEEL CONVERTER FOR SMALL FOUNDRIES.—The Whiting Foundry Equipment Company, Harvey, Ill., has issued catalogue No. 150, describing the Whiting side-blow steel converter. This device is adapted for the production of steel castings in limited quantities and is particularly applicable in connection with apparatus for making grey-iron castings. The catalogue describes the construction of the converter and explains its operation in the manufacture of steel. A layout of a combined grey-iron and steel foundry installed in a railroad shop is also described and illustrated.

SUPERHEATERS.—Two circulars dealing with the maintenance and operation of superheaters are being distributed by the Locomotive Superheater Company, New York. Bulletin No. 6 is entitled "The Most from Superheating," and contains a reprint of the committee report of the Traveling Engineers' Association on superheater locomotive performance. Bulletin No. 8 contains instructions for properly maintaining and operating superheaters. It deals with such matters as lubrication and drifting, flue cleaning, handling units during repairs, etc. Another bulletin, No. 5, describes the company's model "496" pyrometer equipment for locomotive service.

PORTABLE WELDING OUTFITS.—Three types of trucks for transporting portable oxy-acetylene and oxy-hydrogen welding and cutting equipment manufactured by the Davis-Bournonville Company, Jersey City, N. J., are described and illustrated in an eight-page pamphlet. One of these is a cabinet truck which provides permanent mountings for the regulators and gages within a steel locker, which also affords space for the torches, hose, accessories and supplies. The other two are open trucks, one having large wheels especially fitted for traversing rough ground and the other having small wheels, designed for use on floors, pavements and level ground.

CELFOR DRILLS.—Putting Mettle Into Metal is the title given by the Clark Equipment Company, Buchanan, Mich., to a booklet describing the making of Celfor drills and precision tools and telling of various innnovations which the company has put into effect for the benefit of employees, which tend to give them a keener interest in their work and promote harmony between employer and employees. The booklet contains numerous illustrations, one colored two-page illustration showing a general view of the plant and grounds which have been made into an attractive park. Other illustrations show a theatre which is operated by the company without profit and is used by the employees for a great variety of activities; a hospital which is conducted by a hospital association formed among member employees, and several homes which are typical of a large number built by the company and sold to employees at actual cost on their own terms.

EDITORIAL

Railway Age

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Usefulness of the Wedge

The young man who aspires to promotion must constitute himself a wedge, so as to be ready to let somebody force him into the first available opening where there will be an appointment to assume larger responsibilities. This bit of wisdom is brought to mind on reading the letter from H. S. M., published in our issue of November 21. The train despatcher, on occasion, should not hesitate to "butt in" where, if a narrow view were to be taken, only the trainmaster, or some one higher up, could rightfully act. This is true, for example, in cultivating friendly relations with shippers at outlying sidings; or customers who do not see the station very often. Despatchers (and others) do well to do a lot of thinking outside their own immediate field, even if it is but rarely that such thoughts can be put in practice. We all know of clerks who have got ahead by doing some job for the "old man" without being told to do it; taking the boss's own work out of his hands, as it were. Never encroach on a superior's exclusive territory; never meddle; but don't be too fearful of being accused (wrongfully) of doing something of that kind! The thin end of a wedge resembles a knife, but it does not cut.

Paying the Bill for the Steel Strike

It has often been said that increased production must be the chief factor in bringing down the cost of living. Decreased production has proven itself many times the main cause of a rise in prices, a concrete example, and one that is of considerable interest to the railroads, being at present time afforded by the steel industry. Before the steel strike in the latter part of September, 1919, the steel market had practically recovered from the effects of war-time production and was getting on a firm and steady peace basis. During the period of about two and a half months between the beginning of the strike and the first of December prices advanced nearly 20 per cent on rails and other steel products this being almost entirely due to the shortened supply resulting from decreased production. Now, to fill the cup to overflowing, there has come the coal shortage with its resulting curtailment of important and much needed production of iron and steel products. The industry is much farther down in the list of essentials, and as a result is far more affected by the rulings of the Fuel Administration, than during the heatless days of 1918. With such a serious situation confronting them, the steel companies have practically suspended operation of their sales departments, but business continues to come in from all directions and is piling up at an alarming rate. It need hardly be said that the output lost through the steel strike and the coal shortage has caused a deficiency which cannot for a long time be made up. With the demand continuing heavy, as in all probability it will, the result must be increased prices to the consumer, unless prices are held down by artificial means. The amount of the advances will largely depend upon what the large interests in the steel industry can do to check the upward swing, which if it went too far would prove a serious detriment not only to the railroads, but to the country generally. It is, of course, to be regretted that a few labor leaders could bring about such a state of affairs with little or no justification for their actions, and without even the thorough understanding and voluntary support of working men themselves. Nothing of any importance has been gained, and much has been lost, the public paying as usual through the higher prices made unavoidable.

Brooklyn and Belmont

The fatal train wreck at Belmont, N. Y., October 19, reported in our monthly record of derailments, printed in this issue, gives prominence to some lessons as striking as those of the Brooklyn collision, reported in the September record—striking, that is, in their simplicity. They are so obvious that we all know them. The remedies for the errors which caused this wreck can be agreed upon in a minute, when we are ready; but the habit of shutting the eyes to the future—or of trusting to luck—has become so easy that grave problems are deferred indefinitely. Fundamental principles of safe train operation are constantly neglected, and for no other definable reason, apparently, than that one of the characteristics of a great corporation is the spread-out character of its functions and the perfect facility with which responsibility can *always* be shifted from one bureau to another.

One of the fundamentals is that enginemen's eyes, physical and mental, are not infallible. The most experienced and conscientious runners have been running past switch targets, on straight lines, in clear weather, without seeing them, for the last 60 years; and probably they are doing not much better today than they were 60 years ago, for the fault is a deep-seated characteristic of the mind, not entirely curable by human wit. This makes it fundamental that for safe running at high speed the runner's eyes must be given a second chance—at least. This is done by providing a distant signal—what used to be called an advance signal—one to give advance information. The use of signals set from 1,000 ft. to 4,000 ft., in the rear of danger points—switches—has prevented innumerable errors from mental laxness or infirmity, and in that sense has saved innumerable lives.

The New York Central placed distant signals at all facing switches on the main line between Albany and Buffalo away back in 1875-80, when most railroad men in this country knew (and thought) very little about scientific signaling except what they had learned from a Saxby & Farmer model at the Centennial exhibition in Philadelphia. Yet here, in the twentieth century, on a main line between two of the chief cities of the State of New York, trains are run at a mile a minute without a distant signal. One way to meet such a situation—assuming that automatic signals with track circuits are out of the question because of the low income from the traffic of the line—would be to impose a very low speed limit on all trains. (The low speeds then in vogue serve largely to explain why more people were not killed on the railroads 60 years ago). But the only sure means of imposing such a limit today would be automatic governors such as we read of as having been used on the automobiles of our army in France; an expedient which as yet has not been thought of in railroad service.

Another fundamental *fact*, developed by experience, is that